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THE STAR-GUIDE

LATIMER CLARK F.R.A.S.
AND
HERBERT SADLER F.R.A.S.

UNIVERSITY OF CALIFORNIA.

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THE

STAR-GUIDE

THE

STAR-GUIDE

A LIST OF THE

MOST REMARKABLE CELESTIAL OBJECTS

VISIBLE WITH SMALL TELESCOPES

WITH

THEIR POSITIONS

FOR EVERY TENTH DAY IN THE YEAR

AND

OTHER ASTRONOMICAL INFORMATION

BY

LATIMER CLARK, F.R.A.S.

AND

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INTRODUCTION.

THE first portion of this little work is intended primarily to serve as an introduction to the sidereal portion of 'Celestial Objects for Common Telescopes,' the well-known work of the late deeply regretted Prebendary Webb, and is designed for the use of those who possess small telescopes of from two to four inches aperture and upwards, by reminding them what objects to look for at each period of the year, and where to look for them. Many amateurs who are just commencing the study of Astronomy experience some difficulty in the selection of those objects, out of the countless number in the heavens, which are best suited for observation with small telescopes, and are apt to strain their eyes and waste their time in fruitless endeavours to catch faint nebulæ or to separate difficult double stars, which can only really be observed with much larger telescopes than most beginners usually possess. It is hoped, therefore, that to such, a carefully selected list, on a definite plan, excluding all objects which are beyond the grasp of small telescopes, and including nearly all those which can be profitably examined with instruments of from two to three inches of aperture, may be of use. With this view a list of nearly six hundred of the most interesting and beautiful objects visible in the northern heavens with instruments of this description, has been arranged in a tabular form in order of Right Ascension, which the authors hope will be found to contain nearly every double star between the North Pole and 15° South Declination, which can be seen easily with an achromatic of small aperture. The positions and times of transit are given for each tenth day in the year. With very few exceptions no double star

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has been inserted the brightest component of which falls below the seventh magnitude—the magnitude of the smallest of the satellites of Jupiter—or the fainter of which is not brighter than a tenth magnitude star, or any pairs which are too close to be conveniently seen in a telescope of small size. No red star has been included the colour of which cannot be seen, or any nebula or cluster which cannot conveniently be observed with such an instrument.

In the first column of the following list of objects visible with small telescopes the name of the star is given; all those to which Bayer assigned a Greek letter, or those numbered and catalogued by Flamsteed, Bode, or Piazzi, being designated by such letter or number. Flamsteed's numbers precede the name of the constellation to which they refer, *e.g.* 77 Pegasi; but as all Bayer's lettered stars have also numbers assigned to them by Flamsteed, the latter have been omitted. Piazzi's are numbered according to the hour of Right Ascension in which they happened to fall in the year 1800, *e.g.* P. iii. 98 (Eridani); while Bode's numbers follow the name of the constellation, as Coronæ 1. In one or two cases the star has been entered according to its number in the catalogue published by the British Association, as B. A. C. 352 (Andromedæ). In order to avoid all unnecessary technicalities, where a star, either from its comparative faintness or for some other reason, has failed to receive a Greek letter or one of Flamsteed's or Piazzi's numbers, it has been entered simply as a red star or pair in such and such a constellation. Thus the seventh object in the list is entered as 'Pair in Cassiopeia,' with a Right Ascension of $23^h\ 55{\cdot}5^m$, and a North Declination of 59° 43′. The principal star of this pair is known to astronomers as A.Oe$_1$. 26,287 (or O. Arg. N. 26,287), meaning that it is number 26,287 in a catalogue of stars between 45° and 80° North Declination, whose places were determined by Argelander, and that the catalogue was edited by Oeltzen, in the third series of the Annals of the Vienna Observatory, from which we have deduced its apparent place in the list for January 1886. As a *pair* it is termed OΣΣ (or OΣ^2) 254, which refers to its number, 254, in a catalogue of double stars observed by O. Struve. Such details, however, are out of place in a list like the present. In the same manner nebulæ

and clusters have been entered as 'Cluster in Cepheus,' 'Nebula in Cetus,' &c., without giving their numbers in the catalogues of Messier, Sir W., or Sir J. Herschel.

The second column is headed 'Visible,' and is simply intended to show observers at a glance during what months of the year the several objects in the lists may be most conveniently observed.

The third and fourth columns contain the Right Ascension and Declination of the objects, given to the nearest tenth of a minute of time in Right Ascension and the nearest minute of arc in Declination, and reduced to January 1, 1886. All the star places throughout the book have been brought up to this epoch.

The next four columns contain the sidereal time at 9 P.M. on the 1st, 11th, 21st, and last day of every month, and the mean time of transit at Greenwich of every object on those days. Thus the list for each month includes nearly fifty objects which pass the meridian at convenient hours for observation. The observer, however, is by no means confined to the list for each month alone, or to the southern part of the heavens. He may often desire to examine objects in the eastern skies, which may be found, not in the list for the month, but in the lists for the next following month; or he may desire to observe western stars, which will be found in the preceding months. These lists should, therefore, constantly be referred to. The stars transit every day $3^m\ 55{\cdot}91^s$ (or say 4 minutes) earlier than on the preceding day. A star which souths at ten to-night must, therefore, have southed two hours later a month ago, and will south two hours earlier a month hence. Remembering this, and looking at the position of the star, we can easily judge which list to consult. Suppose that on October 20 we desire to observe certain stars in the western heavens. We know from their position that they will be found in the list of stars some two or three months before; we therefore search the July and August lists, and adding, say, 31 days for August, 30 for September, and 20 for October, we find the interval since July 31, to be 81 days. Allowing $3^m\ 56^s$ per diem for acceleration,[1] we get $5^h\ 18^m$ to be *subtracted* from the times given on July 31, and

[1] For the convenience of reckoning a table of these accelerations will be found at page 26.

this will give us the time of southing of all the stars in the July list which are still visible to us. Similarly, for eastern skies, we know that the stars will south at convenient hours some two or three months hence, and will be found probably in the January list. We count, therefore, 72 days to January 1, and *adding* $4^h\ 43^m$[1] to any of the stars in that list, we get their time of southing this evening. Before observing it is convenient to take out these times from the table, and to write them (in an abbreviated form) on a card. Thus for October 20 we have—

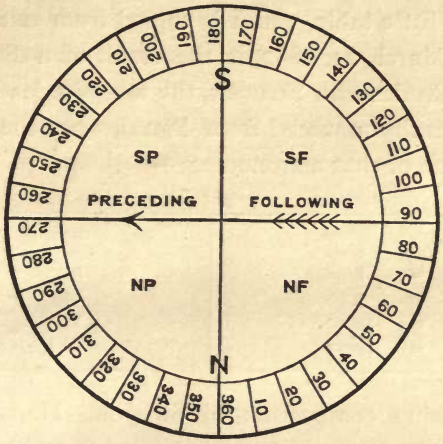
List of Stars	Interval in Days	Time to be SUBTRACTED	List of Stars	Interval in Days	Time to be ADDED
		h. m.			h. m.
July 31 . .	81	5 18	November 1 .	11	0 43
August 31 .	50	3 17	December 1 .	41	2 41
September 30	20	1 19	January 1 .	72	4 43

We are now in a position to find instantly the time of transit of any object in any of the lists from July to January. In making these notes the observer of course includes at the same time the correction (if necessary) due to his difference in longitude. If his station be westward of Greenwich, he must subtract the correction from the left hand column and add it to the right, and *vice versâ*.

The next, or ninth, column contains the distances of the double stars, measured from centre to centre of the stars, and expressed in seconds and tenths of a second of arc. The succeeding column contains the position angle, or the angle of inclination to the meridian, of the smaller star as referred to the larger one of the pair. The following diagram, in which the arrow indicates the direction of motion through the field, will serve to explain the method of expressing position angles at present adopted. Up to about 1820, it was usual to reckon by quadrants, *i.e.* 10°*nf* answered to 80° in our present mode of reckoning, 10°*sf* to 100°, 10°*sp* to 260°, and 10°*np* to 280°. It is, perhaps, as well to remind observers that the present mode of reckoning position angles is not that used in the prediction of occultations in the 'Nautical Almanac,'

[1] For the convenience of reckoning a table of these accelerations will be found at page 26.

where the initial point is taken at the top, or south, and the angles are reckoned round towards the right hand in the direction of the



revolution of the hands of a watch, 180° being at the north, or bottom. Great care has been taken in the selection of the measures in columns nine and ten, and the latest and best ones published up to the end of November 1885 have been given where possible. In the cases of binaries of quick revolution and stars with large proper motion, the position angles and distances have usually been roughly computed for the season in 1886 at which they appear in the lists where no very recent measures could be obtained of them by practised observers.

The eleventh column contains the magnitudes of the stars. In view of the great and, to beginners, most perplexing differences in the values assigned to the same star in the scales used by different astronomers, it has been thought well to adhere to one scale throughout the book, and for this purpose W. Struve's has been selected, as it is the one almost universally used by the great double star observers on the Continent and in America. The well-known English observer, Admiral Smyth, used a scale of his own, nearly agreeing with Sir John Herschel's, for the faint stars, and for the brighter he usually adopted the magnitudes assigned to the stars by Piazzi in his Palermo catalogue, estimating the magnitude of the

fainter component by a comparison of its light with that of the larger star, as given by Piazzi ; but where Piazzi gives both components of a double star Smyth usually adopted his magnitude of both. The following little table, which is copied from one in the *English Mechanic* for March 24, 1882, is the result of a direct collation of Smyth's magnitudes with Struve's, the magnitudes in Smyth above 9·5 being generally assumed from Piazzi, when the stars are found in the catalogue of that astronomer :—

Smyth Mag.		Struve Mag.	Smyth Mag.		Struve Mag.
9·5	=	8·78	13	=	10·65
10	=	9·18	14	=	10·36[1]
11	=	10·10	15, 16	=	10·99
12	=	10·17			

The following comparison by Sir John Herschel of his own magnitudes with those of Struve is copied from his table in vol. 38 of the 'Memoirs of the Royal Astronomical Society.' It must, however, be only considered to apply to his earliest catalogues of double stars, as he himself observes that the magnitudes in his later catalogues show a tendency to creep up in the scale, *i.e.* a 19th or 20th magnitude in his first catalogue would probably only be rated as a 16th in his sixth catalogue ; and it will be found that a star called by him a 20th magnitude in his later observations corresponds more nearly with 13·0 than 12·0 in Struve's[2] scale. The magnitudes down to the seventh are fairly accordant.

H. Mag.		Σ Mag.	H. Mag.		Σ Mag.	H. Mag.		Σ Mag.
8	=	7·30	11·5	=	9·60	15	=	10·87
8·5	=	7·70	12	=	9·80	16	=	11·13
9	=	8·10	12·5	=	10·00	17	=	11·38
9·5	=	8·50	13	=	10·18	18	=	11·61
10	=	8·80	13·5	=	10·36	19	=	11·82
10·5	=	9·10	14	=	10·54	20	=	12·00
11	=	9·30	14·5	=	10·71			

[1] See 'English Mechanic' *supra.*

[2] W. Struve's name is usually conventionally expressed by the Greek capital letter Σ, and his son's, O. Struve, the present director of the Imperial Russian Observatory at Pulkova, by OΣ.

In the present work the magnitudes of many of the brighter stars have been inserted from the Oxford photometrical determinations in vol. 47 of the 'Memoirs of the Royal Astronomical Society,'[1] and the others have been taken from the great work of the late Baron Dembowski, 'Misure Micrometriche di Stelle Doppie e Multiple,' which has lately been edited by Schiaparelli and O. Struve, in nearly every case where the stars are to be found in that work. In other cases they have been taken from the micrometrical observations of Mr. Burnham. The magnitudes of the red stars have been taken from Birmingham's 'Red Star Catalogue' and other sources. In the case of clusters the magnitudes of the brightest and faintest stars in each cluster have been set down.

In the last column are inserted the colours of the stars, which in the case of the double stars have been almost always taken from Dembowski. The discordances in the colours assigned by different astronomers to various stars, even where their observations have been made at the same epoch, are so very marked, that it has been thought advisable that these determinations should rest as far as possible on the authority of one observer only. This column contains also a few brief remarks on the character of some of the objects, which are supplemented in certain cases of interest by concise notes at the foot of each page. A considerable margin has been left for the observer's own notes. A list of about two hundred objects which can be seen with refractors of from four to seven inches aperture, has been added for the convenience of those amateurs who may possess telescopes of this size. A certain proportion only are visible, of course, with but four inches of aperture, but all should be seen with seven. Considerable care has been taken in the selection of the most interesting and beautiful objects within the grasp of telescopes of this size for the list, which is arranged in substantially the same way as the preceding one; the times of transit and the column containing the colours and remarks have, however, been omitted.

[1] The *Uranometria Nova Oxoniensis* was published too late to enable us to make use of the determinations of magnitude which it contains.

Test Objects.

The list of test-objects contains two hundred and fifty stars, which have been selected as tests of the quality of refracting telescopes of from two to seven inches aperture. The stars have been divided into three kinds of tests, viz. dividing tests, defining tests, and space-penetrating tests. Twelve double stars have been arranged, in descending order of difficulty, as tests of the separating power of telescopes of the aperture given. The first star of these twelve should be easily separated with the aperture employed, as high a magnifying power as the telescope and the air will bear being used, while the last three or four stars will be found to be just at the limit of the separating power of the aperture, this being expressed by the fraction $\frac{4{\cdot}56''}{a}$.[1] These are followed by a list of six pairs arranged in the same order, which are intended to serve as tests of the defining power of the telescope, its freedom from spherical aberration, and of the perfection of its figure; each pair consisting of a bright star and a faint and comparatively close companion. The last twelve stars (arranged, as the others, approximately in order of difficulty) are designed to serve as tests of the light-grasping power of the instrument and the acuteness of the observer's eye.

The list of the radiant points of some of the most marked showers of shooting stars gives the date of each shower, the Right Ascension and Declination of the radiant point, and the Greenwich mean time of its rising and southing.

Lunar Craters.

The lists of the approximate longitudes and latitudes of over one hundred lunar craters, arranged alphabetically and in order of longitude, beginning at the western limb, is intended to facilitate the employment of the table giving the position of the Lunar

[1] Dawes, *Memoirs of the Royal Astronomical Society*, vol. xxxv. p. 158. Dallmeyer preferred $\frac{4{\cdot}33''}{a}$. a = aperture of telescope in inches.

Terminator at midnight on each day of the year. The number in ( ) immediately following the name of each formation refers to the corresponding number on the map of the moon, in the fourth edition of ' Celestial Objects for Common Telescopes,' the numbers enclosed in [ ] denoting formations near those bearing the number assigned to them by Mr. Webb. The figures i, ii, iii, iv refer to the quadrant in which the crater is situated.

The table giving the position of the Lunar Terminator at midnight for every night in the year gives the selenographical longitude of the point where the terminator (or boundary between light and darkness) crosses the moon's equator (which it does nearly at right angles) at that time. As the terminator moves towards the east at the rate of 30·5′ (approximately) per hour,[1] we can easily find its position at any other time ; *e.g.* by the table we find the longitude of the terminator at midnight on March 8, 1886, to be 49° 26′ west longitude, and we wish to ascertain what will its position be at 8 A.M. the next morning (March 9)? Subtracting 4°4′ (30·5′ × 8), as the terminator moves towards the east, we find the longitude of the terminator at 8 in the morning on March 9 is 45° 22′ west. In the same way we wish to know when the crater Linné will be on the terminator in January 1886. Turning to the alphabetical table of the longitudes and latitudes of the craters, we find the longitude of Linné to be 11° 33′ west, and we find by the tables giving the position of the Lunar Terminator that the moon's terminator was in 10° 44′ west at midnight on January 11 ; the difference is 0° 49′ west, or the time of sunrise on Linné will be about $10^h\ 22^m$ P.M. (that is, 12 hours less 49 × 2 min.) Similarly, we find that the longitude of the evening terminator at midnight on January 26 was 8° 9′, differing 3° 24′ from that of Linné, so that sunset on Linné will take place about $5^h\ 20^m$ P.M. on that evening. Conversely, we observe that the longitude of the evening terminator at midnight on February 11, 1886, is given in the tables at 6° 15′ east, and on referring to the list of craters arranged in order of longitude, we find Mösting, Moretus, and Archimedes A to be near the terminator at that time, being numbers 211, 262, and a

[1] Roughly speaking, 1° for two hours, or 1′ for two minutes.

crater very near 120 on Webb's map. On referring to that map, and drawing an imaginary line through these craters, we are enabled to see what other formations are on the terminator about that hour.

Variable Stars, &c.

A list of the maxima and minima of twelve remarkable variable stars, with their places, and a table showing the observable heliocentric maxima of Algol and of the somewhat similar variable star δ Libræ for 1886, will, it is hoped, be found of use to those amateurs who are interested in the study of such phenomena.

A short account of the periodical comets expected in 1886 and of those which, though discovered in 1885, pass their perihelia in 1886, closes the work.

Precession of the Equinoxes.

Owing to precession, the apparent places of the stars alter continually from year to year, both in Right Ascension and in Declination; the change is fortunately very small, and may generally be neglected, as even after several years it is seldom sufficient to prevent a star being found in the field of the telescope. Its amount varies in different parts of the heavens, and the formulæ for its computation are somewhat complex, but the tables given below will enable the observer to correct the places of the stars for this quantity without any very serious error, except in the case of circum-polar stars.

The precession of the Equinoxes is caused by a slow gyratory or twisting motion of the pole of the earth round the pole of the Ecliptic, resembling the movement of a spinning top just before it is going to fall. One twist of the axis occupies about 25,700 years, and during this time it carries the position of the vernal Equinox or first point of Aries backwards completely round the Ecliptic, in a direction contrary to the apparent motion of the sun, thereby continually increasing the apparent Right Ascension of all the heavenly bodies, and also affecting their Declinations; the effect

on our reckoning of time is the same as if we had gained one day in 25,700 years, or $\frac{1}{25700}$ of a day per annum. This amounts to about 3·1 seconds, which is about the annual amount of precession for stars near the Equator.

The effect of precession in Right Ascension is always additive (except in the case of a few stars very near the poles of the Ecliptic). Its amount varies with the Declination of the stars and with their Right Ascension, and is roughly given in the following table :—

Annual Value of Precession in Right Ascension.

Declination	From 0^h to 6^h Right Ascension	From 6^h to 12^h Right Ascension	From 12^h to 18^h Right Ascension	From 18^h to 24^h Right Ascension
20° South	$3^s{\cdot}1$ decreasing to $2^s{\cdot}6$	$2^s{\cdot}6$ increasing to $3^s{\cdot}1$	$3^s{\cdot}1$ increasing to $3^s{\cdot}6$	$3^s{\cdot}6$ decreasing to $3^s{\cdot}1$
Equator	3·1 secs.	3·1 secs.	3·1 secs.	3·1 secs.
20° North	$3^s{\cdot}1$ increasing to $3^s{\cdot}6$	$3^s{\cdot}6$ decreasing to $3^s{\cdot}1$	$3^s{\cdot}1$ decreasing to $2^s{\cdot}6$	$2^s{\cdot}6$ increasing to $3^s{\cdot}1$
40° North	$3^s{\cdot}1$ increasing to $4^s{\cdot}2$	$4^s{\cdot}2$ decreasing to $3^s{\cdot}1$	$3^s{\cdot}1$ decreasing to $1^s{\cdot}9$	$1^s{\cdot}9$ increasing to $3^s{\cdot}1$
50° North	$3^s{\cdot}1$ increasing to $4^s{\cdot}7$	$4^s{\cdot}7$ decreasing to $3^s{\cdot}1$	$3^s{\cdot}1$ decreasing to $1^s{\cdot}5$	$1^s{\cdot}5$ increasing to $3^s{\cdot}1$
60° North	$3^s{\cdot}1$ increasing to $5^s{\cdot}4$	$5^s{\cdot}4$ decreasing to $3^s{\cdot}1$	$3^s{\cdot}1$ decreasing to $0^s{\cdot}8$	$0^s{\cdot}8$ increasing to $3^s{\cdot}1$

The precession in Declination is additive from 18 hours Right Ascension to 6 hours, and subtractive from 6 hours to 18 hours. It attains its maximum, about 20 seconds of arc per annum, with objects situated at 12 hours Right Ascension and 24 hours Right Ascension, and falls to a minimum of zero at 6 hours and 18 hours. The following table will give an idea of the change produced by it, but

Annual Value of Precession in Declination.

Right Ascension			Annual Precession	Right Ascension			Annual Precession
h. m.		h. m.	"	h. m.		h. m.	"
0 0	and	24 0	+20·0	12 0	and	12 0	−20·0
1 0		23 0	19·4	13 0		11 0	19·4
2 0		22 0	17·4	14 0		10 0	17·4
2 30		22 30	15·9	14 30		9 30	15·9
3 0		21 0	14·2	15 0		9 0	14·2
3 30		20 30	12·2	15 30		8 30	12·2
4 0		20 0	10·0	16 0		8 0	10·0
4 30		19 30	7·7	16 30		7 30	7·7
5 0		19 0	5·2	17 0		7 0	5·2
5 30		18 30	2·6	17 30		6 30	2·6
6 0		18 0	0·0	18 0		6 0	0·0

it must be remembered that the table refers to stars with North Declination, and that an addition to the Declination of a northern star corresponds to a subtraction from that of a southern star, and

vice versâ. It will be observed that at the utmost it can only change the declination of any object by 20″ per annum, so that by the year 1892 the change will only have amounted to 2′, or about three times the apparent diameter of Jupiter when at opposition.

Future Use of the Tables.

The times of transit of all the objects in this book are given for the year 1886, but by a very simple addition they are equally available for all succeeding years. We have only to add one minute for every year, except at leap-years, when we make a deduction. For example :—

1887. Add 1 minute to the times given.
1888. Add 2 minutes before February 28; after that date deduct 2 minutes.
1889. Deduct 1 minute.
1890. Add 0 minute.
1891. Add 1 minute.

It will be perceived that, although for convenience we abruptly add 1 minute on January 1, the gain is really a continuous one throughout the four years preceding the leap-year. At leap-year we suddenly lose this 4 minutes (or rather $3^m\ 56^s$) owing to the introduction of February 29.

It was originally intended that this work should be published in an annual form under the name of 'Clark's Star Guide,' as a companion volume to Mr. Latimer Clark's annual Transit Tables. As the work progressed it was found difficult to condense the matter satisfactorily into so small a page, and it was therefore thought preferable to issue it in the present more permanent form. The tables giving the daily position of the Lunar Terminator and other matters will be continued in future editions of Clark's Transit Tables.

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A LIST OF

THE MOST REMARKABLE CELESTIAL OBJECTS

VISIBLE WITH SMALL TELESCOPES.

JANUARY (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	3 46	4 25	5 5	5 44	—	—	—	—
ψ^1 **Aquarii**	Nov.—Jan.	23 9·9	− 9 43	4 25	3 46	3 6	2 27	49·4	312	4·0, 8·5	Orange, sky blue (1).
o **Cephei**	July—Mar.	23 13·9	+67 29	4 29	3 50	3 10	2 31	2·6	193	5·2, 7·6	Deep yellow, turquoise. Binary.
Cluster in **Cepheus**	Aug.—Feb.	23 19·2	+60 58	4 34	3 55	3 16	2 36	—	—	9–11	6′ diam. Triangular-shaped (2).
77 **Pegasi**	Dec.—Feb.	23 37·5	+ 9 42	4 52	4 13	3 34	2 54	—	—	5·0	Red.
107 **Aquarii**	Dec.—Jan.	23 40·1	−19 19	4 55	4 16	3 36	2 57	5·6	140	5·3, 6·5	White, bluish. Colours vary.
σ **Cassiopeiæ**	Aug.—Feb.	23 53·2	+55 6	5 8	4 29	3 49	3 10	2·9	327	4·8, 7·1	Greenish white, blue.
Pair in **Cassiopeia**	Aug.—Feb.	23 55·5	+59 43	5 10	4 31	3 52	3 12	58·9	270	7·0, 7·7	Ruby, deep blue. 7·0 variable.
Pair in **Cassiopeia** *	Aug.—Feb.	0 0·3	+57 48	5 15	4 36	3 57	3 17	1·7	311	6·0, 7·0	Yellow, olive. Binary (3).
35 **Piscium**	Dec.—Feb.	0 9·1	+ 8 11	5 24	4 45	4 5	3 26	11·5	149	5·8, 7·2	White, deep blue (4).
α **Cassiopeiæ**	Aug.—Feb.	0 34·0	+55 55	5 49	5 10	4 30	3 51	62·4	280	2·4, 9·5	Pale rose, blue. 2·4 variable?
Great Neb. in **Androm.**	Aug.—Feb.	0 36·3	+40 35	5 51	5 12	4 32	3 53	—	—	—	Hazy 5½ mag. star to naked eye
η **Cassiopeiæ**	Aug.—Feb.	0 42·1	+57 13	5 57	5 18	4 38	3 59	4·9	175	3·5, 7·3	Yellow, rose. Binary (6). [(5).
36 **Andromedæ** *	Sept.—Feb.	0 48·9	+23 1	6 4	5 24	4 45	4 6	1·5	2	6·0, 6·4	Both golden. Binary (7).
77 **Piscium**	Dec.—Feb.	0 59·9	+ 4 18	6 15	5 35	4 56	4 17	32·8	83	6·1, 6·8	White, pale lilac.
ζ **Piscium**	Dec.—Feb.	1 7·7	+ 6 57	6 23	5 43	5 4	4 25	23·8	64	4·2, 5·8	White, pale rose. 4·2 variable.
35 **Cassiopeiæ**	Aug.—Feb.	1 13·5	+64 4	6 28	5 49	5 10	4 30	52·5	350	6·1, 8·0	White, deep red.
Nebula in **Triangulum**	Oct.—Feb.	1 27·4	+30 4	6 42	6 3	5 23	4 44	—	—	—	40′ by 12′. Faint (8).
Cluster in **Cassiopeia**	Aug.—Feb.	1 38·2	+60 40	6 53	6 14	5 34	4 55	—	—	8–11	Fine field. Several pairs (9).
γ **Arietis**	Nov.—Feb.	1 47·2	+18 44	7 2	6 22	5 43	5 4	8·8	179	4·0, 4·2	Both white (10).
α **Piscium**	Nov.—Feb.	1 56·1	+ 2 13	7 11	6 31	5 52	5 13	3·0	323	4·1, 5·4	Green, ashy green.
γ **Andromedæ**	Aug.—Feb.	1 56·9	+41 46	7 11	6 32	5 53	5 14	10·4	63	2·1, 6·1	Golden, ultramarine (11).
ι **Trianguli**	Nov.—Feb.	2 5·7	29 46	7 20	6 41	6 2	5 22	3·6	78	5·1, 6·7	Golden, blue.
Clusters in **Perseus**	Aug.—Feb.	2 11·2	+56 38	7 26	6 46	6 7	5 28	—	—	6·5–13	Visible to naked eye (12).
ι **Cassiopeiæ** *	July—Mar.	2 19·7	+66 53	7 34	6 55	6 16	5 36	7·7	108	5·0, 8·1	Yellowish white, deep blue (13).

(1) Moving together through space.
(2) The brightest star is red.
(3) Period about 105 years; pair in field, 7·0, 8·5 : 299° : 8″·5.
(4) 38 Piscium follows nearly on the parallel at $2^m\ 25^s$; 6·5, 7·2 : 238° : 4″·3, white, ashy.
(5) The 'Queen of the Nebulæ,' oval, very extended in great telescopes, milky white. A round white nebula, 30″ diameter, 26′ south of the great one, and a faint oval one north preceding.
(6) Period probably 149 years; mass of system eight times greater than that of the Sun; distance, 1,340,000 times that of the Earth from the Sun.
(7) Period 316 years.
(8) Requires low powers; a 6½ mag. star in the field, north.
(9) Another cluster, triangular-shaped, 2^m preceding and 40′ north of this.
(10) A 9 mag. star at 85° : 229″.
(11) 6·1 is an excessively close pair, distance 0″·36.
(12) Two magnificent masses, forming the 'sword-handle' of Perseus.
(13) A 7·5 mag. at 262° : 1″·9 from the 5·0 mag., ruddy violet.

JANUARY (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	3 46	4 25	5 5	5 44	—	—	—	—
30 **Arietis**	Nov.—Feb.	2 30·3	+24 9	7 45	7 5	6 26	5 47	38·6	273	5·4, 6·6	White, deep blue.
γ **Ceti**	Nov.—Jan.	2 37·4	+ 2 45	7 52	7 12	6 33	5 54	2·8	290	3·4, 7·1	Whitish yellow, ash.
α **Ceti**	Nov.—Jan.	2 56·3	+ 3 38	8 11	7 31	6 52	6 13	—	—	2·4	Orange (1).
Cluster in **Perseus***	Aug.—Feb.	3 6·9	+46 47	8 21	7 42	7 3	6 23	—	—	10–12	Large stars arranged in lines.
P. iii. 98 **Eridani**	Dec.—Feb.	3 30·9	+ 0 13	8 45	8 6	7 27	6 47	6·2	246	6·3, 8·4	Deep yellow, blue.
Nebula in **Eridanus***	Dec.—Feb.	3 35·1	−18 58	8 49	8 10	7 31	6 51	—	—	—	Pale, but distinct. 60″ diam.
η **Tauri**	Nov.—Feb.	3 40·7	+23 45	8 55	8 16	7 36	6 57	117·3	289	3·0, 6·0	White, pearly (2).
32 **Eridani**	Dec.—Feb.	3 48·6	− 3 18	9 3	8 24	7 44	7 5	6·8	347	5·0, 6·7	Deep yellow, violet.
ε **Persei***	Oct.—Feb.	3 50·2	+39 41	9 4	8 25	7 46	7 7	8·7	10	3·0, 7·9	Greenish yellow, ashy blue.
Cluster in **Perseus**	Aug.—Feb.	4 6·6	+50 57	21	8 42	8 2	7 23	—	—	9–11	Large stars in curves.
φ **Tauri**	Oct.—Feb.	4 13·3	+27 5	9 28	8 48	8 9	7 30	53·6	246	5·0, 8·0	Light red, sky blue.
1 **Camelopardi**	Aug.—Feb.	4 23·0	+53 40	9 37	8 58	8 19	7 39	10·2	307	5·3, 6·3	Deep greenish yellow, green.
α **Tauri*** (*Aldebaran*)	Oct.—Feb.	4 29·4	+16 17	9 44	9 4	8 25	7 46	115·1	34	1·1, 10·3	Rose, blue (3).
ω **Aurigæ**	Oct.—Mar.	4 51·5	+37 43	10 6	9 26	8 47	8 8	6·0	353	5·1, 7·7	White, reddish blue.
Red star in **Auriga**	Oct.—Mar.	4 52·6	+39 29	10 7	9 27	8 48	8 9	—	—	6·4	Red.
β **Camelopardi**	July—Mar.	4 53·3	+60 16	10 7	9 28	8 49	8 9	80·3	208	4·0, 7·2	Deep yellow, white.
14 **Aurigæ**	Oct.—Mar.	5 8·0	+32 33	10 22	9 43	9 3	8 24	14·7	225	5·1, 7·5	Deep yellow, olive.
β **Orionis** (*Rigel*)	Dec.—Feb.	5 9·1	− 8 20	10 23	9 44	9 4	8 25	9·5	201	1·0, 7·8	Yellowish white, blue.
111 **Tauri**	Oct.—Feb.	5 17·7	+17 17	10 32	9 52	9 13	8 34	74·8	271	5·7, 8·3	Yellow, lilac (4).
δ **Orionis**	Dec.—Mar.	5 26·2	− 0 23	10 40	10 1	9 22	8 42	52·5	359	2·0, 6·6	Blue, pearly.
θ¹ **Orion.** and Nebula	Dec.—Mar.	5 29·7	− 5 28	10 44	10 4	9 25	8 46	8·8	33	7·1, 7·9	Both blue, A–B. See (5).
ζ **Orionis***	Dec.—Mar.	5 35·0	− 2 0	10 49	10 10	9 30	8 51	2·6	152	2·3, 5·8	White, blue (6).
γ **Leporis**	Jan.—Feb.	5 39·7	−22 29	10 54	10 14	9 35	8 56	93·7	350	4·0, 6·5	Yellow, garnet (7).
Cluster in **Auriga**	Oct.—Mar.	5 44·8	+32 31	10 59	10 19	9 40	9 1	—	—	9–11	500 stars. Magnificent.

(1) A blue 6·5 mag., 16′ north, with faint pair between.
(2) A blue 7·6 mag. at 312° : 180″·9, and a blue 8·2 mag. at 295° : 190″·8, the three forming a neat triangle.
(3) Distance of Aldebaran from the solar system 400,000 times greater than that of the Earth from the Sun.
(4) Rectilinear motion.
(5) The Trapezium in the midst of the great Nebula, one of the most marvellous objects in the heavens. The Trapezium consists of four bright stars and two very faint ones; the brightest star of the Trapezium, C, 4·9 mag., bright yellow, is 13″·1 distant from A (the 7·1 mag. given above), on an angle of 311°; the fourth bright star, D, 6·8 mag., blue, is 13″·4 from C, on an angle of 61°. The nebula itself is of a greenish hue, and in large telescopes extends over several degrees. It contains several variable stars, and probably consists of various glowing gases.
(6) A 9·5 mag. at 9° : 57″·2.
(7) A small star near the 6·5 mag. Common proper motion.

FEBRUARY (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	28	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	4 48	6 27	7 7	7 34	—	—	—	—
Great Neb. in **Andromeda**	Aug.—Feb.	0 36·3	+40 35	3 49	3 10	2 31	2 4	—	—	—	45′ by 15′ in a 3 inch (1).
η **Cassiopeiæ**	Aug.—Mar.	0 42·1	+57 13	3 55	3 16	2 36	2 9	4·9	175	3·5, 7·3	Yellow, rose (1).
B.A.C. 352 **Andromedæ**	Aug.—Feb.	1 5·9	+44 42	4 19	3 39	3 0	2 33	—	—	6·5	Copper red.
Cluster in **Cassiopeia**	Aug.—Mar.	1 12·0	+58 11	4 25	3 45	3 6	2 39	—	—	7–9·5	Brilliant group, surrounding φ.
Cluster in **Cassiopeia**	Aug.—Mar.	1 25·9	+60 4	4 39	3 59	3 20	2 53	—	—	7·5–10	Fan-shaped. Contains a red star
χ^1 **Ceti**	Nov.—Feb.	1 36·1	−11 54	4 49	4 10	3 30	3 3	3·5	88	5·9, 7·0	White, yellow. [(2).
Pair in **Cassiopeia**	Aug.—Mar.	1 43·0	+64 17	4 56	4 16	3 37	3 10	34·9	34	6·0, 8·2	Orange, turquoise.
P. i. 179 **Arietis**	Nov.—Mar.	1 43·7	+21 42	4 56	4 17	3 38	3 10	2·7	168	6·1, 7·0	Golden, deep green.
56 **Andromedæ**	Aug.—Feb.	1 49·3	+36 41	5 2	4 23	3 43	3 16	183·7	121	5·7, 5·9	Deep yellow, yellow.
γ **Andromedæ**	Aug.—Feb.	1 56·9	+41 50	5 10	4 30	3 51	3 23	10·4	63	2·1, 6·1	Golden, ultramarine (1).
59 **Andromedæ**	Sep.—Mar.	2 4·1	+38 30	5 17	4 37	3 58	3 31	16·5	36	6·0, 6·7	White, pale rose. Pair *n. p.*
66 **Ceti**	Oct.—Mar.	2 6·9	− 2 56	5 20	4 40	4 1	3 33	15·6	229	5·9, 7·5	Yellow, sapphire (3).
Clusters in **Perseus**	Aug.—Mar.	2 11·2	+56 38	5 24	4 45	4 5	3 38	—	—	6·5–13	Contain several red stars (1).
o **Ceti** (*Mira*)	Oct.—Mar.	2 13·6	− 3 30	5 26	4 47	4 8	3 40	115·6	83	Var. 9·5	Reddish, blue. Max. Jan. 5 (4).
Cluster in **Perseus**	Sep.—Mar.	2 34·7	+42 15	5 47	5 8	4 29	4 1	—	—	8–10	Visible to naked eye. 15′ diam.
Nebula in **Cetus** *	Oct.—Mar.	2 36·8	− 0 28	5 49	5 10	4 31	4 3	—	—	—	Round, faint; 9 m. star at 130°: 2′.
η **Persei** *	Sep.—Mar.	2 42·4	+55 25	5 55	5 16	4 36	4 9	28·4	300	4·0, 8·0	Golden, blue (5).
Pair in **Cetus**	Oct.—Mar.	3 3·1	+ 6 59	6 16	5 36	4 57	4 29	81·2	163	7·0, 7·2	White.
Pair in **Perseus**	Oct.—Mar.	3 9·8	+40 3	6 22	5 43	5 4	4 36	3·4	28	6·4, 7·2	White, ash.
Pair in **Camelopardus** *	Sep.—Mar.	3 20·9	+58 58	6 33	5 54	5 15	4 47	2·6	64	6·4, 7·6	White, ashy blue.
Pair in **Camelopardus**	Sep.—Apr.	3 33·3	+59 36	6 46	6 6	5 27	5 0	55·6	34	6·0, 9·0	Orange red, blue.
Pair in **Perseus**	Oct.—Mar.	3 36·5	+38 1	6 49	6 10	5 31	5 3	30·2	87	6·7, 7·5	Red, deep blue (6).
Red star in **Camelopardus**	Sep.—Apr.	3 38·9	+65 10	6 51	6 12	5 33	5 5	—	—	6·0	Fine orange.
P. iii. 213 **Tauri**	Nov.—Mar.	3 54·1	+22 53	7 6	6 27	5 48	5 20	7·3	128	6·5, 7·7	White, blue (7).

(1) See January list. A new star has recently appeared in the Great Nebula in Andromeda, near the nucleus, but is now rapidly fading.
(2) A 9 mag. star in *n. f.* quadrant, from which the cluster takes its divergence.
(3) Moving together through space; common proper motion 0″·5 annually.
(4) See list of Variable Stars.
(5) Forms with three other stars a miniature of Jupiter and his four satellites. Several other stars in the group.
(6) Rectilinear motion.
(7) A 9·0 mag. var.?, at 241°: 58″·1.

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Name of Object	Visible	R.A.	Decl.	1	11	21	28	Dis-tances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	4 48	6 27	7 7	7 34	—	—	—	—
Cluster in **Perseus**	Oct.—Mar.	4 1·5	+49 12	7 14	6 35	5 55	5 28	—	—	9-11	5′ diam. Ring of stars round it.
Pair in **Taurus**	Nov.—Mar.	4 9·4	+ 5 34	7 22	6 42	6 3	5 36	65·5	315	6·2, 6·7	Whitish yellow, rosy white.
χ **Tauri**	Nov.—Mar.	4 15·6	+25 21	7 28	6 49	6 9	5 42	19·2	25	5·7, 8·2	White, reddish blue.
τ **Tauri**	Nov.—Mar.	4 35·4	+22 44	7 48	7 8	6 29	6 2	62·9	212	5·0, 7·3	White, bluish white.
55 **Eridani**	Dec.—Mar.	4 38·1	− 9 0	7 50	7 11	6 32	6 4	9·0	316	6·0, 6·3	Rosy white, white.
P. iv. 255-7 **Tauri**	Nov.—Mar.	4 52·5	+14 23	8 5	7 25	6 46	6 19	39·2	305	5·3, 6·7	Bright green, bright blue (1).
11-12 **Camelopardi**	Oct.—Apr.	4 56·3	+58 52	8 8	7 29	6 50	6 22	180·8	8	4·8, 5·9	White, orange.
Pair in **Auriga** *	Nov.—Mar.	5 2·6	+37 9	8 15	7 35	6 56	6 28	1·6	221	6·8, 7·1	Deep red, deep green.
ι **Leporis** *	Dec.—Mar.	5 7·0	−12 0	8 19	7 40	7 1	6 33	12·6	336	4·5, 10·0	White, pale violet (2).
β **Orionis** (*Rigel*)	Dec.—Mar.	5 9·1	− 8 20	8 21	7 42	7 3	6 35	9·5	201	1·0, 7·8	Yellowish white, blue (3).
Cluster in **Auriga**	Nov.—Mar.	5 21·8	+35 48	8 34	7 55	7 15	6 48	—	—	7·5-11	Arranged as an oblique cross.
δ **Orionis**	Dec.—Mar.	5 26·2	− 0 23	8 38	7 59	7 20	6 52	52·5	359	2·0, 6·6	Blue, pearly (3).
λ **Orionis**	Dec.—Mar.	5 28·8	+ 9 52	8 41	8 2	7 22	6 55	4·3	45	4·2, 6·2	White, deep blue.
θ^2 **Orionis** and Nebula	Dec.—Mar.	5 29·7	− 5 28	8 42	8 2	7 23	6 56	52·6	92	3·5, 5·5	Deep yellow, whitish blue (4).
σ **Orionis** *	Dec.—Mar	5 33·0	− 2 40	8 45	8 6	7 26	6 59	11·1	235	3·9, 9·5	White blue (5).
P. v. 214 **Tauri**	Nov.—Mar.	5 40·9	+24 39	8 53	8 14	7 34	7 7	94·2	166	6·5, 7·0	Deep yellow, red.
Cluster in **Auriga**	Nov.—Mar.	5 44·8	+32 31	8 57	8 18	7 38	7 11	—	—	9-11	24′ diam. including outliers.
Cluster in **Gemini**	Nov.—Mar.	6 1·8	+24 22	9 14	8 35	7 55	7 28	—	—	8-11	Visible to naked eye.
Pair in **Orion**	Dec.—Mar.	6 12·9	+13 29	9 25	8 46	8 6	7 39	73·3	44	6·5, 7·0	White, red.
11 **Monocerotis**	Dec.—Apr.	6 23·3	− 6 57	9 35	8 56	8 17	7 49	7·4	132	5·7, 5·7	White, whitish yellow (6).
Cluster in **Monoceros**	Dec.—Apr.	6 26·2	+ 4 57	9 38	8 59	8 20	7 52	—	—	6-11	Scattered; surrounds 12 Mon.
56 **Aurigæ**	Nov.—Apr.	6 38·5	+43 41	9 50	9 11	8 32	8 4	47·8	22	5·5, 8·0	Yellow, turquoise (7).
Cluster in **Canis Major**	Dec.—Mar.	6 42·1	−20 38	9 54	9 15	8 35	8 8	—	—	8-10	Visible to naked eye.
ζ **Geminorum**	Dec.—Apr.	6 57·4	+20 44	10 9	9 30	8 51	8 23	93·6	352	4·0, 7·2	Deep yellow, deep blue (8).

(1) Also called 26 (Bode) Orionis. A 9·0 mag., purple, at 88° : 54″·7.
(2) A very red 6 mag. (variable) 57 seconds preceding on an angle of 274°.
(3) See Jan. list; 7·8 mag. companion of Rigel is an excessively close double, 0″·2.
(4) A—C 98° : 128″·8: 7·6 mag. These are the three stars in a line, above the fish's mouth in the Great Nebula. The 3·5 mag. is 135″·2 distant from the brightest star of the Trapezium in the direction of 134°.
(5) A 6·8 mag., blue, at 85°, 12″·8 from A, and a 6·3 mag., reddish, at 61° : 41″·6. A triangle precedes this group, the *s.f.* star of the triangle being 210″·8 from σ.
(6) B double, 6·1 mag., white, 103° : 2″·5. A 7 mag. 250″ *n.* *p.*
(7) Moving, owing to proper motion of A.
(8) A faint star, 10·5 mag., at 84° : 87″·2.

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Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	7 38	8 18	8 57	9 37	—	—	—	—
Cluster in **Perseus**	Oct.—Mar.	4 12·3	+49 58	5 35	4 55	4 16	3 37	—	—	6·5–10	Radiated. 10′ diam. (1).
Pair in **Perseus**	Nov.—Mar.	4 16·9	+34 3	5 39	5 0	4 20	3 41	19·6	61	6·3, 7·5	White. Fine field.
62 **Tauri**	Nov.—Mar.	4 17·1	+24 2	5 39	5 0	4 21	3 41	28·9	290	6·0, 8·0	White, blue. Fine field.
κ^1 κ^2 **Tauri**	Nov.—Mar.	4 18·6	+22 0	5 41	5 2	4 22	3 43	340·4	173	4·6, 5·7	White, ashy yellow.
88 **Tauri**	Nov.—Mar.	4 29·4	+ 9 56	5 52	5 12	4 33	3 54	69·2	299	4·0, 7·5	White, reddish yellow.
Pair in **Orion**	Dec —Mar.	4 54·6	+ 3 27	6 17	5 37	4 58	4 19	21·0	260	6·0, 7·0	White, deep green.
P. iv. 278 **Orionis**	Dec.—Mar.	4 56·1	+ 1 27	6 18	5 39	5 0	4 20	14·1	49	6·3, 7·7	White, yellow.
Pair in **Camelopardus**	Oct.—Apr.	5 1·7	+69 42	6 24	5 44	5 5	4 26	5·3	221	7·0, 8·2	Yellow, blue.
ρ^1 **Orionis***	Dec.—Mar.	5 7·3	+ 2 44	6 29	5 50	5 11	4 31	6·8	65	4·8, 8·5	Deep yellow, blue (2).
23 **Orionis**	Dec.—Mar.	5 16·8	+ 3 26	6 39	6 0	5 20	4 41	32·1	28	5·1, 6·6	White, deep blue.
118 **Tauri**	Nov.—Mar.	5 22·2	+25 3	6 44	6 5	5 26	4 46	4·7	199	5·5, 6·4	White, green (3).
Nebula in **Taurus**	Nov.—Mar.	5 27·6	+21 56	6 50	6 10	5 31	4 52	—	—	—	Faint, 5½′ by 3½′ (4).
Cluster in **Auriga**	Nov.—Mar.	5 28·7	+34 4	6 51	6 11	5 32	4 53	—	—	8·0–11	20′ diam. ; star-shaped.
ι **Orionis**	Dec.—Mar.	5 29·8	− 6 0	6 52	6 13	5 33	4 54	11·4	142	3·7, 7·7	Yellow, blue (5).
Nebulæ in **Orion***	Dec.—Mar.	5 40·9	0 0	7 3	6 24	5 44	5 5	—	—	—	Double nebula, 7′ diam. (6).
α **Orionis** (*Betelgeux*)	Dec.—Mar.	5 49·0	+ 7 23	7 11	6 32	5 52	5 13	174·7	152	1·0, 8·9	Topaz, blue (7).
41 **Aurigæ**	Nov.—Apr.	6 3·0	+48 44	7 25	6 46	6 6	5 27	7·9	354	5·8, 6·7	White, ashy (8).
8 **Monocerotis**	Dec.—Mar.	6 17·7	+ 4 39	7 40	7 0	6 21	5 42	13·7	27	4·2, 6·2	Golden, lilac (9).
20 **Geminorum**	Dec.—Apr.	6 25·6	+17 52	7 48	7 8	6 29	5 50	19·9	210	6·1, 7·0	White, greenish white.
Red star in **Auriga**	Dec.—Apr.	6 28·7	+38 32	7 51	7 11	6 32	5 53	—	—	6·0	Fine red (10).
ν^1 **Canis Majoris**	Dec.—Mar.	6 31·4	−18 34	7 53	7 14	6 35	5 55	17·5	261	6·0, 7·5	Pale red, grey.
38 **Geminorum**	Dec.—Mar.	6 48·2	+13 19	8 10	7 31	6 51	6 12	6·3	162	5·4, 7·8	White, deep rose (11).
P. vi. 301 **Lyncis**	Dec.—Apr.	6 56·6	+52 56	8 18	7 39	7 0	6 20	3·2	156	6·5, 6·7	White.
Cluster in **Monoceros**	Dec.—Mar.	6 57·3	− 8 11	8 19	7 40	7 0	6 21	—	—	8·0, 12·0	30′ diam. Brilliant mass (12).

(1) Like a badge of knighthood. Contains pair 6·5, 7·0 ; 327° : 74″·6 ; red, white.
(2) A coarse pair in field, *s. p.*
(3) Common proper motion.
(4) Messier 1, the so-called 'Crab' nebula, non-resolvable.
(5) An 8·2 mag. at 102°·8 : 49″·8, reddish. Fine field.
(6) Wispy, with two nuclei, enclosing faint pair.
(7) Has been thought variable.
(8) Moving together through space.
(9) In a fine scattered group.
(10) Struve calls it 'coloris egregie rubicundi, pæne rosei ;' several pairs near.
(11) Probably binary, and common proper motion.
(12) Contains a red star, 8·5 mag. in the southern portion.

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Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	7 38	8 18	8 57	9 37	—	—	—	—
Cluster in **Monoceros**	Dec.—Apr.	7 9·1	−10 6	8 31	7 52	7 12	6 33	—	—	6–10	Large scattered cluster (1).
δ **Geminorum**	Dec.—Apr.	7 13·3	+22 11	8 35	7 56	7 16	6 37	7·1	205	3·5, 8·9	Yellow, turquoise.
63 **Geminorum**	Dec.—Apr.	7 20·9	+21 41	8 43	8 3	7 24	6 45	44·6	324	5·5, 9·5	Orange, reddish purple (2).
α **Geminorum** (*Castor*)	Dec.—Apr.	7 27·3	+32 8	8 49	8 10	7 30	6 51	5·8	232	3·0, 4·0	Grnish. yellow, grnish. yellow (2).
Cluster in **Gemini** *	Dec.—Apr.	7 31·6	+21 51	8 53	8 14	7 35	6 55	—	—	10·0–12·0	Faint. 12′ diam.
α **Canis Minoris** (*Procyon*)	Dec.—Apr.	7 33·3	+ 5 31	8 55	8 16	7 36	6 57	350	80	1·0, 8·5	Yellowish white, blue (4).
Cluster in **Argo Navis**	Jan.—Apr.	7 36·6	−14 33	8 58	8 19	7 40	7 0	—	—	9·5	Visible to naked eye. 30′ diam.
2 **Argûs**	Jan.— Apr.	7 40·2	−14 24	9 2	8 23	7 43	7 4	16·8	339	5·9, 6·7	Both white.
Cluster in **Argo Navis**	Jan.—Apr.	8 5·3	−12 30	9 27	8 48	8 8	7 29	—	—	5–10	20′ by 12′ (5).
ζ **Cancri**	Jan.—Apr.	8 5·6	+18 0	9 27	8 48	8 9	7 29	5·4	127	5·8, 6·5	White, yellow. Ternary (6).
Pair in **Lynx**	Jan.—May	8 17·0	+42 22	9 39	8 59	8 20	7 41	76·5	168	6·0, 8·0	Orange, blue.
ϕ^2 **Cancri**	Jan.—Apr.	8 19·9	+27 19	9 41	9 2	8 23	7 44	4·8	214	6·0, 6·3	Both white.
72, 74 P. viii. **Argûs**	Jan.—Apr.	8 20·1	−23 40	9 42	9 2	8 23	7 44	41·9	86	6·0, 8·5	Red, green.
P. viii. 124–6 **Cancri**	Jan.—Apr.	8 33·3	+19 57	9 55	9 16	8 36	7 57	92·8	61	6·3, 7·0	Deep yellow, white (7).
Cluster in **Cancer** (*Præsepe*)	Jan.—Apr.	8 33·6	+20 20	9 55	9 16	8 36	7 57	—	—	6·5–9	Contains about 50 large stars.
ε **Hydræ** *	Jan.—Apr.	8 40·7	+ 6 50	10 2	9 23	8 44	8 4	3·3	228	3·8, 7·4	Deep yellow, ashy blue. Binary.
Red star in **Cancer**	Jan.—May	9 3·8	+31 26	10 25	9 46	9 7	8 27	—	—	6·5	Pale red.
38 **Lyncis**	Jan.—May	9 11·7	+37 17	10 33	9 54	9 14	8 35	2·9	236	4·2, 6·3	White, ashy blue.
21 **Ursæ Maj.**	Dec.—May	9 17·6	+54 30	10 39	10 0	9 20	8 41	5·6	311	7·2, 8·2	White, bluish.
α **Hydræ**	Jan.—May	9 22·0	− 8 10	10 43	10 4	9 25	8 45	281·3	153	2, 9·0	Pale red, pale green. A var.
6 **Leonis**	Jan.—May	9 25·8	+10 13	10 47	10 8	9 29	8 49	37·0	75	5·0, 9·5	Orange, deep blue.
ο (14) **Leonis**	Jan.—May	9 35·1	+10 24	10 56	10 17	9 38	8 58	80·9	41	3·8, 9·3	Reddish white, blue (8).
9 **Sextantis**	Jan.—May	9 48·1	+ 5 29	11 9	10 30	9 51	9 11	53·0	294	6·5, 8·5	Reddish, pale blue.
Nebula in **Sextans**	Jan.—May	9 59·5	− 7 10	11 21	10 41	10 2	9 23	—	—	—	Milky white. 3′ by 1′.

(1) A sapphire 6 mag. in the field.
(2) Two other companions forming a curve; 42′ north is a pair 7·5, 9·0: 277°: 36″·0; orange, blue.
(3) Binary, period very long, over 1,000 years. A 3rd star, 9·0, blue, at 164°: 73″·3 probably forms a ternary system; and a 4th, 9·5 mag., at 223°: 210″·0 may also be connected.
(4) Distance of Procyon one million six hundred and eighty thousand times that of the Earth from the Sun. The 8·5 mag. is a very close double. Another star, 7·0 mag., 655″ distant in the direction of 99°, is a close pair; 7·0, 7·3: 141°·1: 1″·3; very white.
(5) A bright orange 5·2 mag. *s.f.*
(6) 5·8 mag. is a close pair, having a 6·6 magnitude star at 58°: 1″·0 (1886·0). The period of this pair is 61 years. C revolves round the common centre of gravity, but in an anomalous orbit.
(7) A 7·3 mag. at 88°: 99″·8, white.
(8) 3·8 mag. is moving.

APRIL (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	9 41	10 20	10 59	11 35	—	—	—	—
Pair in **Gemini**	Dec.—Apr.	6 2·3	+24 27	5 22	4 43	4 4	3 28	31·0	188	6·7, 8·2	Deep yellow, blue.
12 **Lyncis***	Dec.—May	6 36·2	+59 33	5 56	5 17	4 38	4 2	1·7	126	5·7, 6·4	Both white (1).
Pair in **Auriga**	Dec.—May	6 36·3	+40 45	5 56	5 17	4 38	4 2	28·5	131	6·2, 8·4	Orange, turquoise.
μ **Canis Majoris**	Dec.—Mar.	6 50·9	−13 54	6 11	5 32	4 52	4 17	2·9	339	5·2, 8·2	Yellow, turquoise.
Pair in **Auriga**	Dec.—May	6 51·7	+37 15	6 12	5 32	4 53	4 18	25·9	56	6·8, 7·1	Both white.
Cluster in **Canis Maj.**	Dec.—Apr.	6 54·3	−13 32	6 14	5 35	4 56	4 20	—	—	8–10·5	20′ diam.
19 **Lyncis**	Dec.—May	7 13·5	+55 30	6 33	5 54	5 15	4 39	14·7	314	5·2, 6·2	Whitish blue, blue (2).
20 **Lyncis**	Dec.—May	7 13·5	+50 22	6 33	5 54	5 15	4 39	15·0	253	6·9, 7·2	Both white.
Pair in **Gemini**	Dec.—Apr.	7 25·9	+23 8	6 46	6 6	5 27	4 52	11·6	180	6·3, 8·2	White, blue.
α **Geminorum** (*Castor*)	Dec.—Apr.	7 27·3	+32 8	6 47	6 8	5 28	4 53	5·8	232	3·0, 4·0	Both grnish. yellow. Binary (3).
n^1 **Argûs**	Dec.—Mar.	7 29·5	−23 14	6 49	6 10	5 31	4 55	9·0	288	6·0, 6·0	Red, blue.
Cluster in **Argo**	Dec.—Apr.	7 31·3	−14 14	6 51	6 12	5 33	4 57	—	—	5·5–9·5	Visible to naked eye (4).
k^1 **Argûs**	Dec.—Apr.	7 34·2	−26 33	6 54	6 15	5 35	5 0	10·0	318	5·0, 5·0	Both topaz yellow.
5 **Argûs**	Dec.—Apr.	7 42·6	−11 55	7 2	6 23	5 44	5 8	3·3	17	5·7, 7·5	White, olive.
Pair in **Cancer**	Dec.—May	7 58·7	+27 52	7 18	6 39	6 0	5 24	3·3	353	6·5, 7·1	White, deep blue.
Cluster in **Monoceros**	Dec.—May	8 7·9	− 5 27	7 28	6 48	6 9	5 34	—	—	8–10·5	20′ diam.
Pair in **Cancer**	Dec.—May	8 18·2	+20 32	7 38	6 59	6 19	5 44	37·5	191	7·0, 8·2	White, blue.
Pair in **Monoceros**	Dec.—May	8 32·3	− 6 24	7 52	7 13	6 33	5 58	64·6	211	6·0, 7·7	Yellow, whitish blue.
P. viii. 129 **Cancri**	Dec.—May	8 33·8	+20 5	7 53	7 14	6 35	5 59	20·0	55	5·7, 9·5	Deep yellow, blue (5).
31 **Monocerotis**	Dec.—May	8 38·0	− 6 49	7 58	7 18	6 39	6 4	78·3	309	5·5, 7·5	Golden, deep blue.
P. viii. 160 **Hydræ**	Dec.—May	8 39·6	− 2 11	7 59	7 20	6 41	6 5	4·5	260	6·7, 7·7	White, ashy olive.
ι **Cancri**	Dec.—May	8 39·7	+29 11	7 59	7 20	6 41	6 5	30·4	307	4·2, 6·3	Deep yellow, deep blue.
Cluster in **Cancer**	Dec.—May	8 44·9	+12 14	8 4	7 25	6 46	6 10	—	—	9–10·5	About 200 stars, 20′ diam. (6).
17 **Hydræ**	Dec.—May	8 49·9	− 7 32	8 9	7 30	6 51	6 15	4·2	358	6·7, 7·2	Both white.

(1) Binary; period perhaps 650 years. A 7·4 mag. at 307° : 8″·7, bluish red.
(2) A blue 6·5 mag. at 358° : 215″·2
(3) Distance 1,050,000 times that of the Earth from the Sun (see March list).
(4) Contains several pairs.
(5) A 7·0 mag., blue, at 342° : 63″·4; and an 8·0 mag., also blue, at 44° : 82″·5.
(6) Visible in the finder, shaped like a Phrygian cap.

APRIL (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	9 41	10 20	10 59	11 35	—	—	—	—
σ^3 **Ursæ Maj.***	Dec.—June	9 0·4	+67 36	8 20	7 41	7 1	6 26	2·4	233	5·1, 8·7	Yellow, reddish blue. Binary.
Pair in **Cancer**	Dec.—May	9 0·9	+23 26	8 20	7 41	7 2	6 26	7·2	201	6·4, 7·1	White, ashy.
Nebula in **Ursa Maj.**	Dec.—June	9 14·1	+51 29	8 34	7 54	7 15	6 40	—	—	—	4′ by 2′. White (1).
39 **Lyncis**	Dec.—June	9 14·8	+50 2	8 34	7 55	7 16	6 40	6·0	320	6·8, 8·2	White, blue.
41 **Lyncis**	Dec.—June	9 21·2	+46 7	8 41	8 1	7 22	6 47	82·5	162	5·7, 7·5	Deep yellow, bluish white.
τ^1 **Hydræ**	Feb.—Apr.	9 23·4	− 2 16	8 43	8 4	7 24	6 49	64·9	3	5·5, 8·5	White, lilac (2).
Pair in **Leo Minor**	Feb.—June	9 28·2	+40 28	8 48	8 8	7 29	6 54	24·7	147	6·2, 7·2	Both yellowish white (3).
Nebula in **Ursa Maj.**	Dec.—June	9 46·0	+69 37	9 5	8 26	7 47	7 11	—	—	—	9′ by 2½′. Nucleus = 8 m. star (4).
Pair in **Ursa Maj.**	—	10 8·7	+71 38	9 28	8 49	8 9	7 34	16·7	167	6·0, 7·0	White, blue.
ζ **Leonis**	Feb.—June	10 10·3	+23 59	9 30	8 50	8 11	7 36	318·7	342	3·4, 6·0	White, yellow (5).
γ **Leonis**	Feb.—June	10 13·7	+20 25	9 33	8 54	8 14	7 39	3·3	115	2·2, 3·4	Golden, greenish gold (6).
35 **Sextantis**	Mar.—June	10 37·4	+ 5 21	9 57	9 17	8 38	8 3	6·6	240	6·0, 7·0	Yellow, blue.
54 **Leonis**	Mar.—June	10 49·4	+25 21	10 9	9 29	8 50	8 15	6·3	105	4·8, 6·7	Pearly white, ashy green.
Scarlet star in **Crater***	Mar.—June	10 55·0	−17 42	10 14	9 35	8 56	8 20	—	—	Var.	8·5–9·5. Intense blood col. (7).
α **Ursæ Maj.**	Dec.—June	10 56·7	+62 21	10 16	9 37	8 57	8 22	384·9	204	1·9, 8·0	Yellow, violet.
Nebula in **Leo**	Mar.—June	10 59·9	+ 0 35	10 19	9 40	9 1	8 25	—	—	—	3′ by 1′, wht. An 8 mg. star *s. f.*
Nebula in **Ursa Maj.**	Feb.—June	11 8·1	+55 38	10 27	9 48	9 9	8 33	—	—	—	Planet-like, pale, 2′ diam.
ξ **Ursæ Maj.***	Feb.—June	11 12·1	+32 10	10 31	9 52	9 13	8 37	1·7	242	4·0, 4·4	White or yellow (8).
ι **Leonis**	Mar.—June	11 17·9	+11 9	10 37	9 58	9 18	8 43	2·8	63	4·6, 7·4	Yellow, ashy olive.
τ **Leonis**	Mar.—June	11 22·1	+ 3 29	10 41	10 2	9 23	8 47	92·7	173	5·0, 6·7	Golden, bright blue.
57 **Ursæ Maj.***	Mar.—June	11 22·9	+39 58	10 42	10 3	9 23	8 48	5·5	4	5·5, 8·3	White, violet.
17 **Crateris**	Apr.—June	11 26·6	−28 38	10 46	10 6	9 27	8 52	9·0	29	5·5, 5·8	Yellow, violet (9).
90 **Leonis**	Mar.—June	11 28·8	+17 25	10 48	10 9	9 29	8 54	3·2	212	6·5, 7·5	White, bluish (10).
2 **Comæ Berenicis**	Mar.—June	11 58·4	+22 6	11 17	10 38	9 59	9 23	3·8	240	5·8, 7·2	White, ashy.

(1) In field with 37 Ursæ, 6 mag., *n. f.* it. A 7 mag. south.
(2) Moving together through space.
(3) A 7·5 mag. in 325° : 118″·2.
(4) Another nebula 40′ south, 6′ long by 50″ broad; 'splendens stria luminis.' Two pairs in field.
(5) A 3rd star at 306° : 240″.
(6) Binary, period 407 years. The finest pair in the northern sky.
(7) In the field with α Crateris, 42 seconds of time following it. A blue star lies 66″ from the scarlet one in 269°, and another *s. f.*
(8) The earliest calculated binary, period 60 years and nine months.
(9) Common proper motion.
(10) An 8·5 mag., reddish, at 235° : 64″·5.

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MAY (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	11 39	12 18	12 58	13 37	—	—	—	—
Pair in **Camelopardus**	—	8 8·1	+72 46	5 30	4 51	4 11	3 32	43·9	86	5·7, 9·0	Deep yellow, blue.
υ^1 **Cancri**	Dec.—May	8 19·8	+24 54	5 42	5 2	4 23	3 44	5·8	41	6·2, 7·1	Greenish white, olive.
P. viii. 108 **Hydræ**	Dec.—May	8 29·8	+ 7 1	5 52	5 12	4 33	3 54	10·5	27	6·1, 7·1	White, reddish ash.
ϵ **Cancri**	Jan.—May	8 33·9	+19 58	5 56	5 16	4 37	3 58	134·2	249	5·7, 7·0	Yellow, ashy yellow.
Cluster in **Cancer**	Jan.—May	8 44·9	+12 14	6 7	5 27	4 48	4 9	—	—	9–10·5	20′ diam. ; see April list.
Nebula in **Leo Minor** *	Jan.—May	8 45·5	+33 51	6 7	5 28	4 49	4 9	—	—	—	5′ by 1′; faint. 4 stars surround it.
Pair in **Hydra**	Feb.—May	8 51·6	−17 0	6 13	5 34	4 55	4 15	2·4	182	7·0, 7·3	Both white.
66 **Cancri**	Jan.—June	8 54·3	+32 42	6 16	5 37	4 57	4 18	4·5	137	6·0, 8·2	White, bronze.
Pair in **Ursa Maj.**	Dec.—June	9 3·7	+62 8	6 25	5 46	5 7	4 27	24·9	26	6·5, 7·0	Both white.
40 **Lyncis**	Jan.—June	9 14·1	+34 52	6 36	5 56	5 17	4 38	202·3	33	3·1, 8·7	Orange, violet (1).
23 **Ursæ Maj.**	Dec.—June	9 22·6	+63 34	6 44	6 5	5 26	4 46	22·8	271	4·0, 9·0	White, deep blue.
Pair in **Lynx**	Dec.—June	9 23·4	+45 11	6 45	6 6	5 26	4 47	23·8	157	7·2, 8·6	Yellow, blue (2).
7 **Leonis**	Feb.—June	9 29·6	+14 53	6 51	6 12	5 33	4 53	42·6	80	6·5, 8·0	Bluish white, violet.
Pair in **Leo Minor**	Feb.—June	9 34·3	+39 29	6 56	6 17	5 37	4 58	3·4	283	6·8, 8·0	Deep yellow, deep blue.
Nebula in **Ursa Maj.**	—	9 39·4	+72 49	7 1	6 22	5 42	5 3	—	—	—	45″ diam. Whitish. Good field.
Pair in **Leo**	Feb.—June	9 50·7	+20 18	7 12	6 33	5 54	5 14	30·4	175	6·6, 7·5	White, yellow.
α **Leonis** (*Regulus*)	Feb.—June	10 2·3	+12 31	7 24	6 44	6 5	5 26	176·9	307	1·1, 8·3	Bluish white, olive (3).
γ **Leonis**	Feb.—June	10 13·7	+20 25	7 35	6 56	6 16	5 37	3·3	115	2·2, 3·4	Golden, greenish gold (4).
Nebula in **Hydra**	Mar.—June	10 19·3	−18 4	7 41	7 1	6 22	5 43	—	—	—	Pale blue, resembling Jupiter (5).
49 **Leonis** *	Feb.—June	10 29·0	+ 9 14	7 50	7 11	6 32	5 52	2·4	158	6·2, 8·4	White, turquoise.
Nebula in **Leo**	Feb.—June	10 37·9	+12 18	7 59	7 20	6 41	6 1	—	—	—	2′ diam.
Pair in **Hydra**	Mar.—June	10 42·0	−14 40	8 3	7 24	6 45	6 5	70·5	23	6·7, 7·6	Both white (6).
Red star in **Hydra**	Mar.—June	10 46·1	−20 39	8 7	7 28	6 49	6 9	—	—	6·0	Fine red (7).
Pair in **Ursa Maj.**	Jan.—June	10 52·9	+59 31	8 14	7 35	6 56	6 16	34·5	38	6·5, 7·5	Yellow, blue.

(1) 8·7 has a minute companion at 18″.
(2) 7 mag. star in field, *n*.
(3) Moving together through space.
(4) See April list ; a 7 mag. star at 291° : 239″ has large proper motion ; another, 8½ mag., at 302° : 327″·8.
(5) About 30″ diam.
(6) 7·6 is double, with a companion of the same magnitude and colour at 18° : 6″·6. All three stars are nearly in the same straight line. 22′ exactly south of this triple is P. x. 159 ; 7·5, 8·5 : 11° : 30″·7.
(7) Has a blue 9·5 mag. in 90° : 30″.

MAY (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	11 39	12 18	12 58	13 37	—	—	—	—
Pair in **Ursa Maj.**	—	11 7·9	+74 5	8 29	7 50	7 11	6 31	13·4	95	7·0, 7·5	Both white (1).
φ **Leonis**	Mar.—June	11 10·9	− 3 2	8 32	7 53	7 14	6 34	101·4	288	5·0, 8·5	Pale yellow, violet.
Pair in **Crater**	Mar.—June	11 11·2	− 6 31	8 32	7 53	7 14	6 34	60·7	97	6·0, 8·0	White, lilac.
83 **Leonis**	Mar.—June	11 21·0	+ 3 38	8 42	8 3	7 24	6 44	29·5	150	5·8, 7·3	White, deep blue.
Pair in **Ursa Maj.**	Jan.—July	11 32·6	+45 44	8 54	8 14	7 35	6 56	10·4	264	6·0, 8·0	Yellowish white, ash (2).
93 **Leonis**	Mar.—June	11 42·1	+20 51	9 3	8 24	7 45	7 5	74·1	355	4·7, 8·4	Yellow, white (3).
Nebula in **Ursa Maj.**	Mar.—June	11 47·0	+37 37	9 8	8 29	7 50	7 10	—	—	—	90″ diam.
Pair in **Ursa Maj.**	—	11 54·0	+71 17	9 15	8 36	7 57	7 17	33·6	151	7·0, 7·2	Both white.
Pair in **Virgo**	Mar.—June	12 3·6	−11 13	9 25	8 45	8 6	7 27	11·0	92	6·6, 9·2	Yellow, olive (4).
2 **Canum Venat.**	April—July	12 10·4	+41 18	9 31	8 52	8 13	7 34	11·5	259	5·7, 8·2	Deep yellow, blue.
Red star in **Virgo**	April—June	12 19·4	+ 1 25	9 40	9 1	8 22	7 43	—	—	7	Var.? Very full red.
δ **Corvi**	April—June	12 24·0	−15 53	9 45	9 6	8 26	7 47	24·3	214	3·0, 8·5	White, purple.
Nebula in **Virgo**	April—June	12 26·2	+15 3	9 47	9 8	8 29	7 49	—	—	—	Spindle-shaped ; 7′ by 2′ (5).
Pair in **Corvus**	April—June	12 35·3	−12 23	9 56	9 17	8 38	7 58	5·6	305	6·1, 6·2	Yellowish white (6).
γ **Virginis**	April—June	12 35·9	− 0 49	9 57	9 18	8 38	7 59	5·2	156	3·0, 3·0	Both yellow. Binary (7).
α **Canum Venat.** (*Cor. Caroli*)	April—July	12 50·7	+38 56	10 12	9 32	8 53	8 14	20·0	228	3·2, 6·0	Pale yellow, dusky yellow.
Pair in **Draco**	Mar.—Sep.	13 9·2	+67 55	10 30	9 51	9 12	8 32	179·0	297	5·5, 6·3	Both yellowish white (8).
ζ **Ursæ Maj.** (*Mizar*)	Mar.—July	13 19·3	+55 31	10 40	10 1	9 22	8 42	14·3	148	2·2, 4·0	Greenish white, emerald (9).
f **Hydræ**	May—June	13 30·5	−25 55	10 51	10 12	9 33	8 53	10·2	192	5·5, 6·5	Deep yellow, yellow.
81 **Virginis**	April—June	13 31·6	− 7 18	10 52	10 13	9 34	8 55	2·6	42	7·0, 7·3	Both yellow.
Pair in **Virgo**	April—June	13 31·9	+ 2 58	10 53	10 13	9 34	8 55	15·9	32	6·4, 8·7	Yellow, bluish olive.
Cluster in **Canes Venat.**	April—July	13 36·9	+28 57	10 58	10 18	9 39	9 0	—	—	10–12	6′ diam. Compressed mass of
Red star in **Centaurus**	May—June	13 42·6	−27 48	11 3	10 24	9 45	9 5	—	—	6·2	Blood red (10). [stars.
τ **Virginis**	April—June	13 55·8	+ 2 6	11 17	10 37	9 58	9 19	79·6	290	4·0, 8·5	Yellow, light purple.

(1) The 7·0 mag. has a rapid proper motion and sensible parallax, distance 1,050,000 times that of the earth from the sun.
(2) A 9·0 mag. at 88° : 81″·3.
(3) A similar pair in field *s. ϕ.* ; 7·0, 8·5 : 25° : 76″·8.
(4) An 8·2 mag., blue, at 93° : 41″·8, moving.
(5) In the nebulous region of Virgo.
(6) A small star in 228° : 57″·9.
(7) Alternately variable. The period of revolution is about 180 years.
(8) An 8·0 mag., blue, at 232° : 120″·9.
(9) Alcor, 4·5 mag., forms a double star to the naked eye with Mizar. It is 707″·2 distant on an angle of 72°; a 7·5 mag., the 'Sidus Ludovicianum,' is at 101° : 510″·4.
(10) Has a blue companion in 109° : 78″·0.

JUNE (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	13 41	14 20	15 0	15 35	—	—	—	—
Nebula in **Ursa Maj.***	Apr.—July	11 4·8	+56 17	6 24	5 45	5 6	4 30	—	—	—	Rather faint, elongated in 79°.
Pair in **Ursa Maj.**	Apr.—July	11 9·5	+53 23	6 29	5 50	5 10	4 35	12·9	345	5·9, 7·4	White, blue.
Pair in **Ursa Maj.**	Apr.—Aug.	11 24·9	+60 20	6 44	6 5	5 26	4 50	12·3	91	6·7, 7·7	White, blue.
88 **Leonis**	Apr.—June	11 25·9	+15 0	6 45	6 6	5 27	4 51	15·2	322	6·0, 8·2	Yellow, deep reddish blue (1).
Pair in **Leo**	Apr.—June	11 33·7	+19 38	6 53	6 14	5 34	4 59	21·5	304	6·9, 8·0	White, deep blue.
65 **Ursæ Maj.**	Apr.—July	11 49·2	+47 7	7 8	6 29	5 50	5 14	3·7	38	6·3, 8·0	White, blue (2).
P. xii. 32 **Virginis**	Apr.—June	12 12·3	− 3 19	7 31	6 52	6 13	5 37	20·1	197	6·0, 6·6	Both white.
17 **Virginis**	Apr.—June	12 16·7	+ 5 56	7 36	6 57	6 17	5 42	10·7	336	6·0, 8·9	Rosy, dusky red (3).
12 **Comæ Berenicis**	Apr.—June	12 16·8	+26 29	7 36	6 57	6 17	5 42	66·1	168	5·0, 8·0	Yellow, lilac (4).
Pair in **Canes Venat.**	Apr.—July	12 22·6	+45 25	7 42	7 2	6 23	5 48	10·1	160	6·8, 7·4	Yellow, blue.
24 **Comæ Berenicis**	Apr.—June	12 29·4	+19 0	7 48	7 9	6 30	5 55	20·3	271	4·7, 6·0	Golden, deep blue.
γ **Virginis**	Apr.—June	12 35·9	− 0 49	7 55	7 16	6 36	6 1	5·2	156	3·0, 3·0	Both yellow. Binary (5).
Pair in **Coma Berenicis**	Apr.—June	12 39·7	+15 0	7 59	7 20	6 40	6 5	32·1	200	6·4, 7·1	White, yellow (6).
Nebula in **Canes Venat.**	Apr.—July	12 45·6	+41 44	8 5	7 25	6 46	6 11	—	—	—	2½′ diam. Like a comet.
32, 33 **Comæ Berenicis**	Apr.—June	12 46·5	+17 42	8 6	7 26	6 47	6 12	195·1	49	5·7, 6·3	Orange, white.
Pair in **Ursa Maj.**	Apr.—July	12 51·1	+54 44	8 10	7 31	6 52	6 16	3·4	286	6·0, 7·9	White, reddish blue.
θ **Virginis***	Apr.—June	13 4·0	− 4 56	8 23	7 44	7 4	6 29	7·1	343	4·9, 8·5	White, violet (7).
15 **Canum Venat.**	Apr.—June	13 4·9	+39 6	8 24	7 45	7 5	6 30	288·0	297	5·6, 6·2	Yellowish white.
Cluster in **Coma Berenicis**	Apr.—June	13 7·3	+18 46	8 26	7 47	7 8	6 32	—	—	10–12	Globular cluster.
ζ **Ursæ Maj.** (*Mizar*)	Apr.—July	13 19·3	+55 31	8 38	7 59	7 20	6 44	14·3	148	2·2, 4·0	Greenish white, emerald (8).
Pair in **Draco**	Apr.—Aug.	13 23·3	+65 18	8 42	8 3	7 24	6 48	69·0	147	6·4, 6·9	Both white.
Nebula in **Canes Venat.***.	Apr.—July	13 25·1	+47 47	8 44	8 5	7 25	6 50	—	—	—	Double nebula (spiral). Faint.
Pair in **Ursa Maj.**	Apr.—July	13 42·1	+39 7	9 1	8 22	7 42	7 7	71·3	237	5·3, 8·2	Yellowish white, blue.
Pair in **Boötes**	Apr.—July	13 53·9	+26 22	9 13	8 34	7 54	7 19	4·5	243	7·0, 8·1	White, deep blue.

(1) Large common proper motion; a 10 mag. star *s.f.*
(2) A blue 6·5 mag. at 113° : 63″·1.
(3) Moving together through space.
(4) An 8 mag. star *s.f.*
(5) See May list. Colours variable, as well as the magnitudes.
(6) Rectilinear motion.
(7) A 10·0 mag., greyish blue, in 297° : 70″·9.
(8) See May list.

JUNE (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	13 41	14 20	15 0	15 35	—	—	—	—
ι Boötis	Apr.—July	14 12·1	+51 53	9 31	8 52	8 12	7 37	38·2	33	4·6, 8·0	White, deep purple (1).
π Boötis	May—July	14 35·4	+16 54	9 54	9 15	8 36	8 0	5·9	103	4·1, 6·0	White, bright ashy blue.
54 Hydræ	May—June	14 39·4	−24 57	9 58	9 19	8 40	8 4	8·9	129	5·0, 7·0	Deep yellow, reddish violet (2).
ε Boötis	May—July	14 40·0	+27 33	9 59	9 19	8 40	8 5	3·0	329	2·5, 5·0	Deep yellow, fine blue (3).
α Libræ	May—June	14 44·6	−15 34	10 3	9 24	8 45	8 9	229·5	314	3·0, 5·5	Pale yellow, light grey (4).
ξ Boötis	May—July	14 46·1	+19 34	10 5	9 26	8 46	8 11	3·3	260	4·6, 6·7	Yellow, red. Binary (5).
P. xiv. 212 Libræ	May—June	14 50·8	−20 54	10 10	9 30	8 51	8 16	15·4	291	5·5, 7·5	Yellow, grey (6).
Pair in Virgo	May—July	14 58·5	+ 5 56	10 17	9 38	8 59	8 23	9·7	346	6·7, 7·0	Both white.
Pair in Boötes	May—July	15 7·7	+19 42	10 26	9 47	9 8	8 32	24·7	10	5·8, 6·8	Deep yellow, pearl.
δ Boötis	May—Aug.	15 10·9	+33 44	10 29	9 50	9 11	8 36	105·2	79	3·4, 7·4	Yellow, blue (7).
Cluster in Libra	May—July	15 12·7	+ 2 31	10 31	9 52	9 13	8 37	—	—	9·5–11	Fine compressed cluster (8).
Pair in Corona Bor.	May—July	15 25·1	+25 54	10 44	10 4	9 25	8 50	3·1	93	6·7, 8·2	Golden, blue.
Pair in Libra	May—July	15 32·5	− 8 25	10 51	10 12	9 33	8 57	12·0	188	6·2, 6·3	White, greenish yellow.
ζ Coronæ Bor.	May—July	15 35·1	+37 0	10 54	10 14	9 35	9 0	6·2	302	4·4, 5·9	White, ashy blue.
ξ Scorpionis *	May—July	15 58·1	−11 4	11 17	10 37	9 58	9 23	1·3	196	5·0, 5·4	White, pale yellow. Binary (9).
β Scorpionis	May—July	15 58·8	−19 30	11 17	10 38	9 59	9 23	13·4	25	2·7, 4·5	White, lilac (10).
κ Herculis	May—July	16 2·9	+17 21	11 21	10 42	10 3	9 27	30·0	11	5·1, 6·1	Yellow, golden.
ν Scorpionis *	May—July	16 5·5	−19 10	11 24	10 45	10 5	9 30	41·0	337	4·3, 7·0	White, bluish. Quadruplex (11).
49 Serpentis	May—July	16 8·0	+13 50	11 26	10 47	10 8	9 33	3·8	330	7·0, 7·1	Both white. Binary (12).
Cluster in Scorpio	May—July	16 10·3	−22 42	11 29	10 50	10 10	9 35	—	—	10–10·5	Very cmprsd., like a comet (13).
σ Coronæ Bor.	May—Aug.	16 10·4	+34 9	11 29	10 50	10 10	9 35	3·8	206	5·8, 6·7	White, blue. Binary (14).
γ Herculis	May—July	16 16·9	+19 25	11 35	10 56	10 17	9 41	40·5	239	3·6, 8·8	Yellow, lilac.
α Scorpionis * (*Antares*)	May—July	16 22·4	−26 11	11 41	11 2	10 22	9 47	3·0	271	1·1, 7·3	Red, blue (15).
17 Draconis	Apr.—Aug.	16 33·5	+53 9	11 52	11 13	10 33	9 58	3·6	115	5·2, 6·3	White, ashy green (16).

(1) Common proper motion.
(2) Common proper motion.
(3) Binary? "Duplex pulcherrima."
(4) Common proper motion. (5) Period 127 years.
(6) Pair resembling 61 Cygni, large common proper motion.
(7) Common proper motion.
(8) 42 seconds (of time) preceding and 19′ north of 5 Serpentis (an unequal pair).
(9) Period 96 years, α 7·2 mag. bright violet, at 66° : 7″·3. At 281″ distance in the direction of 169° is a small pair, 7·3, 8·0 : 102″·8 : 10″·5; blue, with a faint star at 61″.
(10) A 7 mag. at 31° : 520″.
(11) 4·3 is a close pair, having a blue 6·7 mag. at 7° : 0″·9, and the 7·0 at 41″·0 is also double, with a bluish 8·0 mag. at 46° 2″·0.
(12) Large common proper motion. Long period binary.
(13) A temporary star, 6·5 mag., appeared in this cluster in 1860, and lasted about one month.
(14) Period very long, 850 years about. A faint star at 88° : 57″·5.
(15) Both stars have the same small common proper motion.
(16) A 5·0 mag., 16 Draconis, at 194° : 90″·3.

JULY (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	15 39	16 19	16 58	17 38	—	—	—	—
54 **Virginis**	May—July	13 7·4	−18 13	6 28	5 49	5 10	4 31	5·2	35	6·3, 7·0	Yellowish, reddish.
34, 35 (Bode) **Draconis**	—	13 9·2	+67 54	6 30	5 51	5 12	4 32	178·8	296	5·6, 6·0	Yellow, white (1).
Nebula in **Canes Venat.***	May—Aug.	13 10·7	+42 38	6 32	5 52	5 13	4 34	—	—	—	7′ by 3′. Faint.
1 **Boötis**	Apr.—July	13 35·3	+20 32	6 56	6 17	5 38	4 58	4·6	141	6·2, 9·3	Blue, very blue (2).
83 **Ursæ Maj.**	May—Aug.	13 36·4	+55 16	6 57	6 18	5 39	4 59	—	—	5·0	Red orange (3).
P. xiii. 219, 220 **Boötis**	Apr.—July	13 45·2	+21 50	7 6	6 27	5 48	5 8	85·8	208	6·3, 6·7	White, yellowish white (4).
κ **Boötis**	May—Aug.	14 9·4	+52 19	7 30	6 51	6 12	5 32	12·8	238	4·5, 6·6	Lemon yellow, deep blue (5).
Pair in **Boötes**	Apr.—July	14 11·3	+20 40	7 32	6 53	6 14	5 34	4·1	176	6·4, 8·5	White, olive.
P. xiv. 69 **Boötis**	Apr.—July	14 17·6	+ 8 5	7 39	6 59	6 20	5 41	6·2	188	5·7, 6·5	White, olive blue.
χ **Turdi Solitarii**	May—July	14 19·1	−19 27	7 40	7 1	6 21	5 42	35·0	296	6·0, 7·2	Both white (6).
Pair in **Boötes**	Apr.—July	14 23·6	+28 49	7 44	7 5	6 26	5 47	25·5	262	6·1, 7·0	Both white.
ε **Boötis**	Apr.—July	14 40·0	+27 33	8 1	7 22	6 42	6 3	3·0	329	2·5, 5·0	Deep yellow, fine blue.
μ **Libræ***	May—July	14 43·1	−13 41	8 4	7 25	6 45	6 6	1·4	335	5·2, 6·2	White, whitish blue.
39 **Boötis**	Apr.—July	14 45·8	+49 11	8 7	7 27	6 48	6 9	3·5	45	5·5, 6·2	White, bluish white.
Pair in **Boötes'**	Apr.—July	14 56·2	+54 18	8 17	7 38	6 58	6 19	40·3	342	6·2, 7·0	Both white (7).
Pair in **Boötes**	Apr.—July	14 56·7	+47 43	8 17	7 38	6 59	6 20	35·5	157	6·0, 8·2	White purple.
44 **Boötis**	Apr.—July	15 0·1	+48 6	8 21	7 42	7 2	6 23	5·0	241	5·0, 5·9	Yellow, ashy green (8).
P. xv. 39 **Boötis**	Apr.—July	15 12·4	+51 22	8 33	7 54	7 15	6 35	75·8	107	6·7, 8·5	Deep yellow, blue.
Pair in Serpens	May—July	15 13·3	+10 50	8 34	7 55	7 15	6 36	13·2	172	6·3, 7·3	Both white.
μ **Boötis**	May—July	15 20·2	+37 45	8 41	8 2	7 22	6 43	108·3	172	4·5, 6·5	Yellow, bluish yellow (9).
δ **Serpentis**	May—July	15 29·4	+10 55	8 50	8 11	7 31	6 52	3·4	188	3·9, 5·5	Greenish yellow, ashy green.
Pair in **Corona Bor.**	May—July	15 42·2	+36 48	9 3	8 24	7 44	7 5	30·7	323	7·0, 7·9	White, deep violet.
P. xv. 220 **Serpentis**	May—July	15 51·5	+ 3 44	9 12	8 33	7 54	7 14	10·4	323	6·9, 8·4	White, olive.
ρ **Coronæ Bor.**	May—July	15 56·7	+33 39	9 17	8 38	7 59	7 19	76·1	92	6·0, 8·5	White, blue (10).

(1) An 8·0 mag., deep blue, at 232° : 120″·9.
(2) Two other blue stars in the field, one *s. p.*, the other *n. p.*
(3) Brightened suddenly in August 1868.
(4) In field with 6 Boötis, a 5 mag. star.
(5) Moving together through space.
(6) 7·2 is a close pair, there being an 8·2 mag. at 102° : 1″·4.
(7) A small white nebula with a bright nucleus in the field, *p.*
(8) Colours and magnitudes variable. Binary, period 261 years.
(9) 6·5 is double with an 8 mag. companion at 100° : 0″·85; this forms a binary pair, period 270 years; the two form a ternary system with μ Boötis itself.
(10) Change, owing to proper motion of 6·0 mag.

JULY (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit Angles	Mag.	Colours and Remarks
		h m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	15 39	16 19	16 58	17 38	—	—	—	—
Pair in **Draco**	—	16 5·2	+70 34	9 26	8 46	8 7	7 28	46·9	84	6·2, 8·2	Deep yellow, blue.
ρ (5) **Ophiuchi**	June—July	16 18·7	−23 11	9 39	9 0	8 21	7 41	3·8	357	5·0, 5·3	Pale topaz, blue (1).
λ **Ophiuchi***	June—Aug.	16 25·2	+ 2 14	9 46	9 6	8 27	7 48	1·7	44	4·4, 5·4	White, ashy green. Binary (2).
Cluster in **Hercules**	May—Sept.	16 37·6	+36 41	9 58	9 19	8 39	8 0	—	—	10–12	Superb. Visible to naked eye (3).
Cluster in **Ophiuchus**	June—Aug.	16 41·3	− 1 45	10 2	9 22	8 43	8 4	—	—	9–11	Globular, 3′ diam.
Pair in **Draco**	May—Oct.	16 47·2	+59 41	10 8	9 28	8 49	8 10	47·3	350	6·7, 7·7	Reddish yellow, blue.
Cluster in **Ophiuchus**	June—Aug.	16 51·2	− 3 55	10 12	9 32	8 53	8 14	—	—	9–11	10′ diam. (4).
μ **Draconis**	May—Oct.	17 3·0	+54 37	10 23	9 44	9 5	8 25	2·4	163	5·0, 5·0	Rdsh. white, white. Binary (5).
36 **Ophiuchi**	June—July	17 8·4	−26 25	10 29	9 50	9 10	8 31	4·3	198	5·5, 5·5	Reddish yellow, yellow (6).
α **Herculis**	June—Sept.	17 9·4	+14 31	10 30	9 51	9 11	8 32	4·7	116	3·0, 5·5	Golden, perfect azure (7).
δ **Herculis**	May—Sept.	17 10·3	+24 59	10 31	9 51	9 12	8 33	16·5	186	2·9, 8·2	Pale white, ruddy purple (8).
Cluster in **Hercules***	May—Oct.	17 13·7	+43 15	10 34	9 55	9 15	8 36	—	—	10–11·5	Compressed cluster, faint.
61 **Ophiuchi**	June—Aug.	17 38·8	+ 2 38	10 59	10 20	9 41	9 1	20·3	94	5·5, 6·2	Both white.
τ **Ophiuchi***	June—Aug.	17 56·9	− 8 11	11 17	10 38	9 59	9 19	1·8	256	5·0, 6·0	White, ash. Binary (9).
70 **Ophiuchi***	June—Aug.	17 59·7	+ 2 32	11 20	10 41	10 1	9 22	2·1	20	4·3, 6·2	Deep yel., rdsh. purp. Bin. (10).
Cluster in **Scutum Sob.**	July—Sept.	18 12·4	−13 50	11 33	10 53	10 14	9 35	—	—	9–10	Large, scatter'd, 100 stars at least.
Neb. in **Scutum Sobieski**	July—Sept.	18 13·0	−17 11	11 33	10 54	10 15	9 35	—	—	—	The 'Horse-shoe.' Vis. in finder
Cluster in **Sagittarius**	July—Sept.	18 29·5	−23 59	11 50	11 10	10 31	9 52	—	—	9·11	Bright. Globular. [(11).
α **Lyræ** (*Vega*) *	June—Nov.	18 33·1	+38 41	11 53	11 14	10 35	9 55	49·2	156	0·2, 9·5	Pale sapphire, blue (12).
ϵ^1 **Lyræ**	June—Nov.	18 40·6	+39 33	12 1	11 21	10 42	10 3	3·1	16	4·6, 6·3	White, blue (13).
ϵ^2 **Lyræ**	June—Nov.	18 40·6	+39 30	12 1	11 21	10 42	10 3	2·6	135	5·1, 5·2	Both white. [diam.
Cluster in **Antinous**	June—Sept.	18 45·0	− 6 25	12 5	11 26	10 47	10 7	—	—	8–10·5	Magnificent; fan-shaped; 12′
β **Lyræ**	June—Nov.	18 45·9	+33 14	12 6	11 27	10 47	10 8	45·6	149	Var. 7·0	Whitish yellow, blue (14).
ο **Draconis**	May—Nov.	18 49·5	+59 15	12 10	11 30	10 51	10 12	31·4	338	4·7, 8·1	Bright yellow, blue.

(1) Two 8 mag. stars at 152″ and 161″ and a faint one at twice the distance. Background otherwise black.
(2) Period 122 years, or perhaps nearly twice that.
(3) Small apertures only show a few stars sprinkled over it.
(4) 50′ *p.*, a little *n.* of 30 Oph., 5·0 mag., orange.
(5) Period 648 years.
(6) Binary, very large proper motion, in which a 7 mag. at 12′ 10″ shares. A 9 mag. at 306° : 198″ from the close pair is not connected with this remarkable system. The two stars of the close pair are variable.
(7) Stationary, but common proper motion. 3·0 var. from 3·0 to 4·0 in about three months.
(8) Rectilinear motion.
(9) Period 218 years; a 9·5 mag. at 127° : 100″·3.
(10) Period 94½ years. Distance of 70 Oph. 1,270,000 times that of the Earth from the Sun; mass of the system three times that of the Solar system; distance between the two stars equal to that of the planet Neptune from the Sun.
(11) In a magnificent group of stars. In a state of change.
(12) Distance of Vega 1,140,000 times that of the Earth from the Sun. Another star, variable?, at 40° : 150″ ±.
(13) ϵ^1–ϵ^2. 173° : 207″·5. Several stars between.
(14) β Lyræ in var. 3·5 to 4·5 mag. in $12^d\ 21^h\ 47^m$ with double maximum and minimum. A 9·2 mag., yellow, at 318° : 66″·0, and a 9·4, lilac, at 19° : 85″·8. A minute pair *s. f.*

AUGUST (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mags.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	17 42	18 21	19 9	19 40	—	—	—	—
Pair in **Hercules**	June—Sept.	16 0·7	+13 38	7 19	6 40	6 1	5 21	33·8	327	6·2, 7·3	Yellow, white.
$\nu^1\ \nu^2$ **Coronæ Bor.**	May—Sept.	16 18·2	+33 58	7 37	6 58	6 18	5 39	369·4	165	5·1, 5·6	Yellow, yellow (1).
Cluster in **Ophiuchus***	June—Aug.	16 26·1	−12 47	7 45	7 5	6 26	5 47	—	—	10–11	Faint, large.
36, 37 **Herculis**	June—Sept.	16 34·9	+ 4 26	7 54	7 14	6 35	5 56	69·5	230	5·7, 6·7	White, blue.
Nebula in **Hercules**	June—Sept.	16 39·7	+24 1	7 58	7 19	6 40	6 0	—	—	—	Planetary, 8″ diam., blue (2).
43 **Herculis**	June—Sept.	16 40·3	+ 8 47	7 59	7 20	6 40	6 1	82·3	230	5·5, 9·0	Rose, blue.
19 **Ophiuchi**	June—Sept.	16 41·4	+ 2 16	8 0	7 21	6 41	6 2	22·3	92	6·0, 9·0	White, ash.
α 34 **Ophiuchi**	June—Sept.	16 58·9	+13 44	8 17	7 38	6 59	6 20	294·7	116	5·8, 6·3	White, reddish yellow (3).
33 **Herculis**	June—Sept.	17 9·4	+14 31	8 28	7 49	7 9	6 30	4·7	116	3·0, 5·5	Golden, perfect azure (4).
ρ **Herculis**	June—Sept.	17 19·7	+37 15	8 38	7 59	7 20	6 40	3·8	313	4·6, 5·5	Greenish white, emerald (5).
53 **Ophiuchi**	June—Sept.	17 29·2	+ 9 40	8 48	8 8	7 29	6 50	41·3	191	5·6, 7·3	White, reddish blue.
ν^1 **Draconis**	May—Oct.	17 29·9	+55 16	8 48	8 9	7 30	6 50	61·8	313	4·7, 4·7	Yellowish white, white (6).
P. xvii. 200 **Herculis**	June—Sept.	17 36·4	+24 34	8 55	8 16	7 36	6 57	16·1	8	6·0, 8·5	Golden, turquoise.
67 **Ophiuchi**	June—Sept.	17 54·9	+ 2 56	9 13	8 34	7 55	7 15	54·8	143	4·5, 7·7	White, deep blue.
95 **Herculis**	June—Sept.	17 56·7	+21 36	9 15	8 36	7 56	7 17	6·0	261	5·0, 5·2	Green, red (7).
Pair in **Hercules**	May—Oct.	18 0·1	+48 27	9 19	8 39	8 0	7 21	27·2	120	6·3, 8·0	White, sky blue.
59 **Serpentis**	July—Sept.	18 21·4	+ 0 8	9 40	9 0	8 21	7 42	3·8	316	5·7, 7·7	Deep yellow, indigo blue.
Cluster in **Serpens**	July—Sept.	18 22·0	+ 6 29	9 40	9 1	8 22	7 42	—	—	9–10	Visible to naked eye.
39 **Draconis**	May—Oct.	18 22·2	+58 44	9 41	9 1	8 22	7 43	3·6	359	5·2, 8·1	White, blue (8).
Pair in **Draco**	May—Oct.	18 31·3	+52 16	9 50	9 10	8 31	7 52	25·8	272	5·7, 8·0	Yellow, deep blue.
ζ **Lyræ**	June—Nov.	18 40·8	+37 29	9 59	9 20	8 40	8 1	43·7	149	4·0, 6·0	White, green.
Red star in **Scutum Sob.**	July—Oct.	18 44·0	− 8 2	10 2	9 23	8 44	8 4	—	—	7·5	Fine red.
Nebula in **Lyra**	June—Nov.	18 49·3	+32 53	10 8	9 28	8 49	8 10	—	—	—	Annular, 70″ by 55″.
$\theta^1\theta^2$ **Serpentis**	July—Sept.	18 50·5	+ 4 3	10 9	9 29	8 50	8 11	21·8	104	4·0, 4·4	Yellow, golden yellow (9).

(1) A grey 6 mag. *f.* ν^2. Both ν^1 and ν^2 have small companions; ν^1 a 10·5 mag. at 237° : 66″·4, ν^2 a 9·5 mag., garnet, at 15° : 104″·6.
(2) Equal in light to 8 mag. star: a reddish 6 mag. in field *s. f.*
(3) A 7 mag. at 13° : 238″·7.
(4) See July list. One of the loveliest objects in the heavens.
(5) In field *s. f.* is a pair, 5·8, 8·5, 13° : 32″·6. Yellow, blue.
(6) Common proper motion.
(7) The colours have been thought variable. A 7 mag. *n. p.*
(8) A 7·5 mag., ashy blue, at 21° : 89″·3.
(9) Suspected of variability; fine field.

AUGUST (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	19 42	18 21	19 10	19 40	—	—	—	—
15 **Aquilæ**	July—Oct.	18 59·0	− 4 12	10 17	9 38	8 59	8 19	34·5	207	6·0, 7·5	White, red lilac.
6 (Bode) **Cygni**	May—Nov.	19 9·2	+49 40	10 28	9 48	9 9	8 30	9·7	219	5·8, 6·1	Deep yellow, yellow (1).
η **Lyræ**	June—Nov.	19 9·9	+38 57	10 28	9 49	9 9	8 30	28·2	84	4·1, 8·0	Bluish white, violet (2).
θ **Lyræ**	June—Nov.	19 12·4	+37 56	10 31	9 51	9 12	8 33	100·7	70	5·0, 8·0	Yellow, blue (3).
β **Cygni** (*Albireo*)	July—Nov.	19 26·1	+27 43	10 44	10 5	9 26	8 46	34·5	56	2·7, 5·3	Golden, blue (4).
Red star in **Sagittarius**	July—Sept.	19 27·8	−16 37	10 46	10 7	9 27	8 48	—	—	6·5	Fine ruby.
α **Aquilæ** (*Altair*)	July—Oct.	19 45·2	+ 8 34	11 3	10 24	9 45	9 5	156·5	310	1·0, 9·0	White, violet.
ϵ **Draconis** *	—	19 48·6	+69 59	11 7	10 27	9 48	9 9	2·9	5	4·2, 7·2	Deep yellow, turquoise.
Nebula in **Vulpecula**	July—Nov.	19 54·6	+22 25	11 13	10 33	9 54	9 15	—	—	—	The 'Dumb-bell' Nebula.
θ **Sagittæ**	July—Nov.	20 4·9	+20 34	11 23	10 44	10 4	9 25	11·4	326	6·0, 8·1	White, turquoise (5).
Red star in **Capricornus**	Aug.—Sept.	20 10·4	−21 40	11 28	10 49	10 10	9 30	—	—	Var.	6·5-9·0? Pure ruby.
$\alpha^2\alpha^1$ **Capricorni**	Aug.—Oct.	20 11·7	−12 54	11 30	10 50	10 11	9 32	376·3	291	3·0, 4·0	Both deep yellow (6).
σ **Capricorni**	Aug.—Sept.	20 12·8	−19 28	11 31	10 52	10 12	9 33	55·8	177	5·0, 8·3	Orange, violet.
o^2 **Capricorni**	Aug.—Sept.	20 23·4	−18 57	11 41	11 2	10 23	9 43	22·1	240	6·0, 7·0	White, bluish white.
γ **Delphini**	July—Nov.	20 41·4	+15 43	11 59	11 20	10 41	10 1	11·3	271	4·0, 5·7	Reddish yellow, green (7).
ϵ **Equulei**	July—Oct.	20 53·4	+ 3 51	12 11	11 32	10 53	10 13	10·6	73	6·1, 7·4	White, ashy blue (8).
12 **Aquarii**	July—Oct.	20 58·1	− 6 16	12 16	11 37	10 57	10 18	2·7	192	6·0, 8·0	Yellow, blue.
61 **Cygni**	Jan.—Nov.	21 1·8	+38 11	12 20	11 40	11 1	10 22	20·7	121	5·0, 6·0	Golden yellow, orange (9).
P. xxi. 1 **Cygni**	July—Nov.	21 3·8	+29 43	12 22	11 42	11 3	10 24	3·5	313	6·1, 8·1	White, blue (10).
1 **Pegasi**	July—Nov.	21 16·8	+19 19	12 35	11 55	11 16	10 37	36·2	311	4·3, 8·2	Deep yellow, lilac.
Cluster in **Pegasus**	July—Nov.	21 24·5	+11 39	12 42	12 3	11 24	10 44	—	—	10·5-11·5	Globular, 5′ diam.
Cluster in **Aquarius**	July—Oct.	21 27·5	− 1 20	12 45	12 6	11 27	10 47	—	—	10·0-11·5	$3\frac{1}{2}$′ diam.
Cluster in **Cygnus**	July—Nov.	21 28·1	+47 56	12 46	12 7	11 27	10 48	—	—	7-10	Splendid, 1° diam.
ϵ **Pegasi**	July—Nov.	21 38·6	+ 9 21	12 56	12 17	11 38	10 58	140·4	322	2·4, 8·8	Deep yellow, violet.

(1) Large common proper motion pair resembling 61 Cygni. Distance, 430,000 times that of the Earth from the Sun. Beautiful field.
(2) Three other pairs in large field.
(3) Fine field.
(4) One of the finest and brightest coloured pairs.
(5) A 6·7 mag., yellow, at 225° : 76″·5.
(6) α^2 has a 9·5 mag. *comes* at 156° : 154″·5 which is coarsely quadruple, and a very small double *comes* at 150° : 7″·4. α^1 has a 9 mag. lilac *comes* at 221° : 44″·3, and several faint companions.
(7) 5·7 variable in colour. An 8 mag. at 141″ *n. f.*
(8) 6·1 has a 6·8 mag. *comes* at 285° : 1″·3. Binary.
(9) Motion probably rectilinear, not binary, as has been supposed, with very large common proper motion. One of the first stars whose distance was determined; recent measures give about 430,000 times the distance of the Earth from the Sun.
(10) A third, 10 mag., at 58″, a fourth more distant.

SEPTEMBER (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	19 44	20 23	21 3	21 38	—	—	—	—
Pair in **Ophiuchus**	June—Aug.	17 1·1	− 1 31	6 18	5 38	4 59	4 24	20·3	280	6·0, 8·7	White, bluish.
Pair in **Ophiuchus**	June—Sep.	17 22·5	+11 30	6 39	6 0	5 20	4 45	27·1	283	6·3, 7·3	White, blue.
Pair in **Hercules**	May—Sep.	17 45·6	+25 20	7 2	6 23	5 44	5 8	6·6	142	6·8, 8·4	White, ashy.
Pair in **Hercules**	May—Sep.	17 54·7	+30 3	7 11	6 32	5 53	5 17	19·5	278	6·9, 7·9	Reddish yellow, sky blue.
Red star in **Serpens**	June—Aug.	17 56·0	−12 19	7 13	6 33	5 54	5 19	—	—	6·8	Strong reddish.
Nebula in **Draco**	—	17 58·3	+66 38	7 15	6 36	5 56	5 21	—	—	—	Planetary. 20″ diam. Blue.
P. xvii. 362 **Tauri Pon.**	July—Sep.	18 0·3	+12 0	7 17	6 38	5 58	5 23	6·6	258	6·3, 7·2	White, reddish olive.
Pair in **Draco**	May—Oct.	18 0·9	+56 26	7 17	6 38	5 59	5 23	38·4	24	6·8, 7·7	White, white (1).
100 **Herculis**	June—Oct.	18 3·2	+26 5	7 20	6 40	6 1	5 26	14·0	3	5·5, 5·5	Both greenish yellow.
Pair in **Draco**	June—Nov.	18 31·3	+52 15	7 48	7 8	6 29	5 54	25·8	272	5·7, 8·0	Deep yellow, deep blue.
Pair in **Taurus Pon.**	June—Sep.	18 39·9	+ 5 22	7 56	7 17	6 38	6 2	2·2	115	6·2, 6·6	Both white (2).
5 **Aquilæ**	June—Sep.	18 40·6	− 1 4	7 57	7 18	6 38	6 3	13·0	122	6·3, 7·3	White, clear blue (3).
Pair in **Lyra**	June—Nov.	18 50·7	+33 50	8 7	7 28	6 48	6 13	45·4	350	5·5, 7·6	Straw colour, purple (4).
Pair in **Aquila**	June—Sep.	18 54·7	+12 44	8 11	7 32	6 52	6 17	16·7	259	6·8, 8·2	Reddish orange, deep blue (5).
Red star in **Aquila**	June—Sep.	18 58·3	− 5 51	8 15	7 35	6 56	6 21	—	—	7·3	Var.? Fine deep red (6).
Cluster in **Lyra** *	June—Nov.	19 12·1	+29 59	8 28	7 49	7 10	6 34	—	—	10·5-11·5	A nebula in small telescopes.
Pair in **Vulpecula**	June—Nov.	19 15·5	+26 27	8 32	7 52	7 13	6 38	54·5	5	6·2, 6·3	Deep blue, red.
e **Aquilæ**	July—Nov.	19 24·7	− 3 2	8 41	8 2	7 22	6 47	—	—	6·0	Fine orange red. Var.?
Pair in **Cygnus**	May—Nov.	19 31·3	+59 53	8 48	8 8	7 29	6 54	76·5	287	5·7, 7·2	Golden, blue.
16 **Cygni**	May—Nov.	19 38·8	+50 16	8 55	8 16	7 36	7 1	37·8	135	5·1, 5·2	Both dull yellow.
χ^1 **Cygni**	June—Nov.	19 42·1	+33 28	8 58	8 19	7 40	7 4	25·7	72	4·8, 8·2	Deep yellow, reddish blue (7).
ζ **Sagittæ**	June—Nov.	19 43·9	+18 51	9 0	8 21	7 42	7 6	8·6	313	5·2, 8·4	White, olive blue.
57 **Aquilæ**	July—Nov.	19 48·4	− 8 29	9 5	8 25	7 46	7 11	35·8	171	5·1, 6·0	Golden, blue (8).
ψ **Cygni**	May—Nov.	19 52·7	+52 8	9 9	8 30	7 50	7 15	3·4	183	5·0, 7·1	Whitish yellow, ashy blue.

(1) 7·7 has an 8·2 mag. star at 147° : 5″·9.
(2) Slight motion in angle, distance constant at 2″·22. Good test for small instruments.
(3) A faint star, which may be variable, at 146° : 27″·5.
(4) 5·5 is a close and very unequal pair. All three moving together through space.
(5) In low power field with 11 Aquilæ, *n.f.* 11 Aq. is a delicate and beautiful pair. 5·1, 9·0 : 260° : 17″·0, white, sky blue.
(6) $2^m\ 43^s$ *f.* 12 Aquilæ, nearly on parallel.
(7) Fine field. About 1^m *p.* 10′ south, is a little 8 mag. pair 3″ apart. About 1° *s.f.* is the variable χ^2 Cygni.
(8) The colours should be watched; they are possibly variable.

SEPTEMBER (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	19 44	20 23	21 3	21 38	—	—	—	—
Pair in **Cygnus**	June—Nov.	19 59·5	+38 1	9 16	8 36	7 57	7 22	23·8	335	7·2, 8·4	Red, blue. Superb colours.
Pair in **Aquila**	July—Oct.	20 9·1	− 3 51	9 25	8 46	8 7	7 31	14·1	233	6·5, 7·7	White, olive blue.
0°0′ **Cygni**	May—Nov.	20 10·0	+46 24	9 26	8 47	8 8	7 32	338·1	323	4·0, 5·5	Orange, cerulean blue (1).
β **Capricorni**	July—Oct.	20 14·6	−15 10	9 31	8 51	8 12	7 37	205·4	267	3·0, 6·5	Deep yellow, deep blue (2).
Pair in **Cepheus**	May—Dec.	20 23·6	+56 16	9 40	9 0	8 21	7 46	26·3	118	6·0, 8·0	White, deep blue.
52 **Cygni**	July—Nov.	20 41·0	+30 17	9 57	9 18	8 38	8 3	6·5	60	4·4, 9·0	Orange, blue (3).
Pair in **Cepheus**	May—Dec.	20 46·5	+58 19	10 3	9 23	8 44	8 9	115·2	262	6·5, 7·3	White, clear red.
Cluster in **Capricornus**	July—Nov.	20 47·1	−12 58	10 3	9 24	8 45	8 9	—	—	10·5-11·5	3′ diam. Faint (4).
γ **Equulei**	July—Nov.	21 4·9	+ 9 38	10 21	9 42	9 2	8 27	362·0	153	4·3, 6·5	Pale yellow, bluish.
Cluster in **Cygnus**	June—Dec.	21 25·3	+46 36	10 41	10 2	9 23	8 47	—	—	9·5–10·5	Large and coarse.
β **Cephei**	—	21 27·2	+70 4	10 43	10 4	9 25	8 49	13·5	250	3·5, 7·7	White, deep blue.
ε **Capricorni**	July—Oct.	21 30·7	−19 58	10 47	10 7	9 28	8 53	47·5	69	4·5, 8·5	White, bluish.
Cluster in **Capricornus**	July—Oct.	21 33·9	−23 41	10 50	10 11	9 31	8 56	—	—	10·5-11·0	Fairly bright, comet-like (5).
μ **Cygni**	July—Nov.	21 39·0	+28 14	10 55	10 16	9 36	9 1	3·2	119	4·5, 6·3	Whitish yellow, blue (6).
Red star in **Aquarius**	July—Nov.	21 40·6	− 2 44	10 57	10 17	9 38	9 3	—	—	6·5	Very red. Var. in colour and [mag.?
Pair in **Pegasus**	July—Nov.	21 48·9	+19 11	11 5	10 25	9 46	9 11	22·2	111	6·1, 8·1	Deep yellow, blue.
Red star in **Cepheus**	July—Dec.	21 53·4	+63 4	11 9	10 30	9 51	9 15	—	—	5·4	Deep red orange.
41 **Aquarii**	Aug.—Nov.	22 8·0	−21 38	11 24	10 45	10 5	9 30	4·8	115	6·8, 8·2	Topaz, blue (7).
P. xxii. 65 **Lacertæ**	July—Nov.	22 13·9	+37 11	11 30	10 50	10 11	9 36	15·5	193	6·2, 8·3	White, deep blue.
ζ **Aquarii**	Aug.—Nov.	22 23·0	− 0 36	11 39	10 59	10 20	9 45	3·3	329	4·1, 4·2	Both whitish yellow (8).
8 **Lacertæ**	July—Nov.	22 30·7	+39 3	11 46	11 7	10 28	9 52	22·5	186	6·0, 7·0	Whitish green, green (9).
7¹ **Aquarii**	Aug.—Nov.	22 41·6	−14 40	11 57	11 18	10 39	10 3	28·5	115	5·9, 9·2	White, amethyst.
Pair in **Cepheus**	—	22 48·7	+67 23	12 4	11 25	10 46	10 10	69·1	281	5·7, 8·4	Opal, deep blue.
Pair in **Cepheus**	July—Jan.	22 58·7	+59 49	12 14	11 35	10 56	10 20	33·9	276	6·2, 8·7	White, deep blue.

(1) A 7·0 mag., deep blue, at 174° : 107″·1. Fine field.
(2) A blue 8·5 mag. at 134° : 226″·7.
(3) In the midst of a wonderful branching nebulosity; invisible, however, with small instruments.
(4) Follows P. xx. 325. Capricorni, 6 mag., 2^{3} exactly on parallel.
(5) Precedes 41 Capr. (5·8 mag.) 1^{m} 40^{s}, and is 6′ *n*. An 8 mag. star close *s.f.* the cluster.
(6) Common proper motion, and probably binary. A 7·0 mag., blue, at 56° : 208″, which does not belong to the system.
(7) An 8·5 mag. *n. f.*
(8) Binary of long period; 1,625 years.
(8) There is a faint star at 28″ from the 7·0 mag., and a yellow 9 mag. star at 81″·9 from the 6·0 mag.

OCTOBER (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	21 42	22 22	23 3	23 40	—	—	—	—
39 **Draconis**	June—Nov.	18 22·2	+58 44	5 41	5 1	4 22	3 43	3·6	359	5·2, 8·1	White, blue (1).
Red star in **Lyra** *	June—Nov.	18 28·3	+36 54	5 47	5 7	4 28	3 49	—	—	8	Intense crimson. Var.
Pair in **Lyra**	June—Nov.	18 39·5	+44 49	5 58	5 19	4 39	4 0	25·9	10	6·8, 8·0	Reddish yellow, blue.
ϵ^1 **Lyræ**	June—Nov.	18 40·6	+39 33	5 59	5 20	4 40	4 1	3·1	16	4·6, 6·3	White, blue (2).
ϵ^2 (5) **Lyræ**	June—Nov.	18 40·6	+39 30	5 59	5 20	4 40	4 1	2·6	137	5·1, 5·2	Both white.
Pair in **Draco**	June—Dec.	18 56·1	+62 15	6 15	5 35	4 56	4 17	16·9	124	6·2, 9·0	Reddish yellow, blue.
Pair in **Lyra**	June—Nov.	19 4·2	+34 35	6 23	5 43	5 4	4 25	13·3	271	6·3, 8·2	White, deep blue (3).
Pair in **Sagitta**	July—Nov.	19 15·8	+18 56	6 34	5 55	5 16	4 36	8·8	288	6·4, 8·3	White, deep blue.
Red star in **Sagitta**	July—Nov.	19 21·3	+19 34	6 40	6 0	5 21	4 42	—	—	6·1	Orange (4).
P. xix. 154 **Cygni**	June—Nov.	19 23·7	+49 54	6 42	6 3	5 23	4 44	71·8	307	6·7, 7·7	Yellow, deep blue.
β **Cygni** (*Albireo*)	July—Nov.	19 26·1	+27 43	6 44	6 5	5 26	4 46	34·5	56	2·7, 5·3	Golden, blue (5).
ϵ **Sagittæ**	July—Nov.	19 32·1	+16 12	6 50	6 11	5 32	4 52	90·7	81	5·7, 7·8	Golden, light blue.
Cluster in **Cygnus**	June—Nov.	19 37·3	+39 56	6 56	6 16	5 37	4 58	—	—	9·5–11·5	Fine; near Milky Way.
Pair in **Draco**	May—Nov.	19 38·3	+60 15	6 57	6 17	5 38	4 59	18·1	28	6·3, 8·0	White, sky blue.
P. xix. 276–7 **Cygni**	June—Nov.	19 41·5	+35 49	7 0	6 21	5 41	5 2	14·7	126	6·2, 6·8	Yellow, blue.
P. xix. 278 **Cygni**	June—Nov.	19 41·6	+34 44	7 0	6 21	5 41	5 2	38·1	28	6·0, 8·2	Deep yellow, deep blue.
26 **Cygni**	May—Nov.	19 58·2	+49 47	7 16	6 37	5 58	5 18	41·7	146	5·3, 8·5	Golden, whitish blue.
Cluster in **Vulpecula**	July—Nov.	20 7·2	+26 9	7 25	6 46	6 7	5 27	—	—	6·0–10·0	Large and rich.
Pair in **Cepheus**	May—Dec.	20 15·6	+55 2	7 34	6 54	6 15	5 36	2·9	341	6·0, 7·2	White, blue.
Pair in **Cygnus**	June—Nov.	20 19·0	+42 37	7 37	6 58	6 19	5 39	96·4	63	6·5, 7·5	Yellow, blue.
Pair in **Cygnus**	June—Nov.	20 34·3	+38 15	7 52	7 13	6 34	5 54	24·4	332	6·8, 8·5	Yellow, blue (6).
49 **Cygni**	July—Nov.	20 36·4	+31 54	7 55	7 15	6 36	5 57	2·8	49	6·0, 8·2	Yellow, blue.
Pair in **Cygnus**	June—Nov.	20 58·0	+39 3	8 16	7 37	6 57	6 18	18·8	300	6·5, 9·0	Golden, emerald.
P. xx. 465 **Cygni**	June—Nov.	20 59·6	+41 10	8 18	7 38	6 59	6 20	57·4	185	5·8, 8·0	White, deep blue.

(1) A 7·5 mag., ashy blue, at 21° : 89″·3.
(2) Cf. July list. A 10·0 mag. at 135° : 145″·4 from ϵ^1 and 37° : 129″·0 from ϵ^2. Several other minute stars between the pairs, two of which, 45″ apart, form the 'duplex debilissima' of Struve.
(3) Another pair in field *n.f.*; 6·4, 7·4; 260° : 17″·1; yellow, olive blue.
(4) In fine group of stars, one of which, 6·2 mag., is also of a fine red orange colour.
(5) Cf. August list. 5·3 has been thought variable. The colours of bright pairs are usually best shown by putting the stars *very* slightly out of focus, so as to enlarge the spurious disc.
(6) Rapid rectilinear motion.

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Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	21 42	22 22	23 3	23 40	—	—	—	—
δ **Equulei** *	July—Nov.	21 9·0	+ 9 33	8 27	7 48	7 8	6 29	40·0	21	4·5, 10·0	Yellow, purplish (1).
3 **Pegasi**	July—Nov.	21 32·0	+ 6 7	8 50	8 11	7 31	6 52	39·2	349	5·0, 6·0	White, grey (2).
P. xxi. 248 **Cephei**	June—Dec.	21 35·5	+56 58	8 53	8 14	7 35	6 56	11·8	121	5·8, 7·5	White, bluish (3).
'Garnet' star in **Cepheus**	June—Dec.	21 40·0	+58 15	8 58	8 19	7 39	7 0	—	—	Var.	Deep orange (4).
Pair in **Cepheus**	June—Dec.	21 48·1	+55 16	9 6	8 27	7 47	7 8	19·5	195	5·4, 6·2	White, ashy green.
Cluster in **Cepheus**	June—Dec.	21 54·8	+54 17	9 13	8 33	7 54	7 15	—	—	9–11	Very large, but poor.
29 **Aquarii**	Aug.—Nov.	21 56·2	−17 31	9 14	8 35	7 55	7 16	3·7	244	7·0, 7·2	White, bluish.
P. xxi. 401 **Lacertæ**	June—Dec.	22 0·3	+59 19	9 18	8 39	8 0	7 20	183·4	73	6·5, 7·5	Both white (5).
Cluster in **Lacerta**	July—Dec.	22 10·8	+49 18	9 29	8 49	8 10	7 31	—	—	8–10	Fine, but straggling (6).
53 **Aquarii**	Aug.—Nov.	22 20·3	−17 19	9 38	8 59	8 20	7 40	8·2	305	6·0, 6·4	Both white.
δ **Cephei**	July—Dec.	22 24·9	+57 50	9 43	9 3	8 24	7 45	40·8	192	Var. 5·7	Yellow, deep blue (7).
μ **Pegasi**	Aug.—Dec.	22 37·7	+29 38	9 56	9 16	8 37	7 58	89·8	339	3·0, 9·0	Deep yellow, bluish.
P. xxii. 219 **Aquarii**	Aug.—Nov.	22 42·0	− 4 49	10 0	9 20	8 41	8 2	3·6	253	6·8, 7·3	Yellow, white (8).
τ^2 **Aquarii**	Aug.—Nov.	22 43·6	−14 12	10 1	9 22	8 43	8 3	132·0	293	4·0, 9·0	Orange, blue.
15 **Lacertæ**	Aug.—Dec.	22 46·9	+42 42	10 5	9 25	8 46	8 7	—	—	5·0	Fine orange red.
83, 84 **Aquarii**	Aug.—Nov.	22 59·3	− 8 19	10 17	9 38	8 58	8 19	261·0	147	5·5, 6·8	White, red.
2 **Cassiopeiæ**	Aug.—Feb.	23 4·7	+58 43	10 22	9 43	9 4	8 24	167·9	163	6·1, 8·3	Yellowish white, bluish.
ψ^1 **Aquarii**	Aug.—Dec.	23 9·9	− 9 43	10 28	9 48	9 9	8 30	49·4	312	4·0, 8·5	Orange, sky blue (9).
P. xxiii. 69 **Aquarii**	Aug.—Dec.	23 17·8	− 9 5	10 35	9 56	9 17	8 38	4·8	253	6·8, 7·7	Reddish white, greyish blue.
Red star in **Andromeda**	Aug.—Feb.	23 18·7	+40 58	10 36	9 57	9 18	8 38	—	—	6·5	Copper red.
Nebula in **Andromeda**	Aug.—Feb.	23 20·4	+41 54	10 38	9 59	9 19	8 40	—	—	—	Planetary, blue.
δ **Sculptoris**	Oct.	23 43·0	−28 46	11 1	10 21	9 42	9 3	74·3	297	5·0, 9·0	White, bluish white.
6 **Cassiopeiæ** *	Aug.—Feb.	23 43·2	+61 35	11 1	10 22	9 42	9 3	1·6	196	5·1, 7·6	Golden, turquoise.
Pair in **Cassiopeia**	Aug.—Feb.	23 55·5	+59 43	11 13	10 34	9 54	9 15	58·9	270	Var. 7·7	Ruby, deep blue (10).

(1) 4·5 is an excessively close pair, having the shortest period known among binary stars as yet, about 10½ years.
(2) Pretty little pair 6′ south.
(3) A 7·5 mag., blue, at 340° : 19″·8.
(4) Sir W. Herschel's 'garnet' star, now orange. Variable, 4–6 mag., but period not well determined.
(5) A 9·5 mag. at 39° : 90″·3 ; a 6·7 mag. at 38° : 236″·7, and a distant 7·5 mag.
(6) 16′ in length, followed by splendid field.
(7) A is var. 3·5 to 4·5 mag. in $5^d\ 8^h\ 47\frac{1}{2}^m$.
(8) An 8 mag. at 140° : 48″·5. Moving.
(9) Cf. January list.
(10) Magnificent colours. A var. 5·0–8·0 mag. (?) Cf. January list.

NOVEMBER (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Dis-tances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	23 44	0 24	1 3	1 39	—	—	—	—
Cluster in **Cygnus**	June—Nov.	20 19·0	+40 21	5 35	4 56	4 17	3 41	—	—	9–10·5	Fine group.
Pair in **Cygnus**	June—Nov.	20 30·2	+32 7	5 46	5 7	4 28	3 52	23·7	285	6·1, 8·4	Yellow, deep blue.
48 P. xx. 243 **Cygni**	July—Nov.	20 33·0	+31 9	5 49	5 10	4 31	3 55	179·1	175	5·6, 6·0	Both whitish yellow.
Pair in **Capricornus**	July—Nov.	20 41·9	−18 37	5 58	5 19	4 39	4 4	15·6	294	6·0, 7·0	Both white.
P. xx. 376 **Equulei** *	July—Nov.	20 50·0	+ 4 6	6 6	5 27	4 48	4 12	2·0	287	6·2, 7·9	Orange, purple.
λ **Equulei**	July—Nov.	20 56·6	+ 6 44	6 13	5 33	4 54	4 19	2·5	226	6·5, 6·5	Both white.
Nebula in **Aquarius**	July—Nov.	20 57·9	−11 49	6 14	5 35	5 55	4 20	—	—	—	Planetary, pale blue (1).
Pair in **Cygnus**	July—Nov.	21 2·1	+33 40	6 18	5 39	5 0	4 24	8·0	225	7·4, 8·0	Both white (2).
Pair in **Cygnus**	July—Dec.	21 6·5	+47 4	6 23	5 43	5 4	4 29	134·2	190	6·1, 6·9	White, deep yellow (3).
Pair in **Pegasus**	July—Nov.	21 27·7	+20 13	6 44	6 4	5 25	4 50	2·9	331	7·2, 7·7	Both white.
Pair in **Cepheus**	July—Mar.	21 32·2	+66 15	6 48	6 9	5 30	4 54	180·1	26	6·0, 6·1	Deep yellow, white.
76 **Cygni**	July—Dec.	21 37·0	+40 17	6 53	6 14	5 34	4 59	64·3	230	5·5, 9·0	White, blue.
Red star in **Cygnus**	July—Dec.	21 38·6	+37 30	6 55	6 15	5 36	5 1	—	—	7·8	Very fine ruby.
Cluster in **Cepheus**	July—Mar.	21 43·2	+65 17	6 59	6 20	5 41	5 5	—	—	9·5–11·5	Loose cluster, 10′ diam.
100 **Aquarii** (*Bode*)	July—Nov.	21 48·7	− 3 51	7 5	6 25	5 46	5 11	20·8	185	6·2, 9·0	White, blue.
ξ **Cephei**	July—Mar.	22 0·4	+64 4	7 16	6 37	5 58	5 22	6·5	283	4·9, 6·6	Bluish white, ashy blue (4).
Cluster in **Lacerta**	July—Dec.	22 0·8	+45 56	7 17	6 37	5 58	5 23	—	—	8·5–10·5	About 50 stars in field.
P. xxii. 33 **Pegasi** *	July—Dec.	22 8·9	+16 38	7 25	6 46	6 6	5 31	10·5	355	6·5, 9·1	Golden, blue (5).
Pair in **Cepheus**	—	22 10·8	+72 44	7 27	6 47	6 8	5 33	28·9	348	5·5, 8·0	Deep yellow, turquoise.
33 **Pegasi** *	July—Dec.	22 18·2	+20 17	7 34	6 55	6 16	5 40	2·1	180	6·1, 8·7	White, red (6).
Pair in **Cepheus**	July—Mar.	22 18·4	+66 8	7 34	6 55	6 16	5 40	4·2	95	6·6, 7·4	Reddish white, deep blue.
ζ **Aquarii**	Aug.—Dec.	22 23·0	− 0 36	7 39	7 0	6 20	5 45	3·3	329	4·1, 4·2	Both whitish yellow (7).
5 **Lacertæ**	July—Dec.	22 24·8	+47 7	7 41	7 1	6 22	5 47	—	—	4·7	Red orange.
Pair in **Lacerta**	July—Dec.	22 38·6	+38 53	7 55	7 15	6 36	6 0	2·8	280	6·2, 8·5	Golden, ashy.

(1) 25″ by 17″. Bears magnifying like a planet.
(2) Rectilinear motion.
(3) 6·1 is a close and unequal pair. $3^m\ 51^s$ *f.* 63 Cygni.
(4) Probably slow binary.
(5) Rectilinear motion.
(6) Common proper motion; a third star, 8·5 mag. blue, at 329° : 63″·6, is fixed in space.
(7) Binary; cf. September list.

NOVEMBER (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	30	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	23 44	0 24	1 3	1 39	—	—	—	—
P. xxii. 306 **Pegasi**	Aug.—Jan.	23 2·0	+32 12	8 18	7 39	6 59	6 24	8·5	146	6·6, 7·8	White, deep blue.
Pair in **Andromeda**	Aug.—Feb.	23 4·8	+47 21	8 21	7 41	7 2	6 27	15·0	253	6·7, 7·7	Yellowish white, rosy.
94 **Aquarii**	Sep.—Dec.	23 13·1	−14 5	8 29	7 50	7 10	6 35	13·6	346	5·0, 7·2	Deep yellow, deep blue (1).
Pair in **Pisces**	Sep.—Jan.	23 18·4	+ 3 6	8 34	7 55	7 16	6 40	7·0	231	6·7, 8·9	Red, ashy blue.
P. xxiii. 100–1 **Cassiop.**	Aug.—Feb.	23 24·7	+57 55	8 40	8 1	7 22	6 46	75·8	269	5·0, 7·0	Whitish blue, yellow (2).
P. xxiii. 216–7 **Pegasi**	Sep.—Jan.	23 47·1	+11 17	9 3	8 23	7 44	7 9	18·7	282	6·3, 7·0	Yellow, ashy yellow.
σ **Cassiopeiæ**	Aug.—Feb.	23 53·2	+54 59	9 9	8 30	7 50	7 15	2·9	327	4·8, 7·1	Greenish white, blue.
Nebula in **Pegasus**	Sep.—Jan.	23 57·3	+15 30	9 13	8 34	7 54	7 19	—	—	—	Round disc, 75″ diam.
Pair in **Andromeda**	Aug.—Feb.	0 14·0	+37 36	9 30	8 50	8 11	7 36	64·0	18	7·3, 9·0	White, bluish (3).
Cluster in **Cassiopeia**	—	0 20·7	+70 45	9 36	8 57	8 18	7 42	—	—	8–11	Large and straggling.
55 **Piscium**	Sep.—Jan.	0 33·9	+20 49	9 49	9 10	8 31	7 55	6·4	193	5·2, 8·2	Yellow, turquoise.
Great Neb. in **Andromeda**	Aug.—Feb.	0 36·2	+40 35	9 52	9 12	8 33	7 58	—	—	—	The 'Queen of the Nebulæ' (4).
Nebula in **Cetus**	Nov.	0 42·0	−25 54	9 58	9 18	8 39	8 4	—	—	—	40′ by 6′, cream colour.
P. o. 251 **Piscium**	Sep.—Feb.	0 53·5	+ 0 10	10 9	9 30	8 50	8 15	21·0	315	6·9, 8·0	Yellow, olive blue (5).
Pair in **Andromeda**	Aug.—Feb.	0 53·6	+44 6	10 9	9 30	8 50	8 15	7·7	192	6·0, 7·0	White, ashy blue.
77 **Piscium**	Sep.—Feb.	0 59·9	+ 4 18	10 15	9 36	8 57	8 21	32·8	83	6·1, 6·8	White, pale lilac.
37 **Ceti**	Sep.—Feb.	1 8·7	− 8 13	10 24	9 45	9 6	8 30	49·5	331	5·5, 7·5	White, bluish white (6).
P. i. 39–40 **Cassiop.**	July—Mar.	1 13·3	+64 4	10 29	9 49	9 10	8 35	52·5	350	6·2, 8·0	White, red.
P. i. 85–87 **Piscium**	Oct.—Feb.	1 22·4	+ 7 22	10 38	9 59	9 19	8 44	69·5	99	6·0, 7·5	Yellow, blue.
Pair in **Andromeda**	Aug.—Mar.	1 42·1	+47 20	10 58	10 18	9 39	9 3	1·9	220	6·5, 7·2	White, blue (7).
γ **Arietis**	Oct.—Mar.	1 47·2	+18 14	11 3	10 23	9 44	9 9	8·8	179	4·0, 4·2	Both white (8).
ι **Trianguli**	Oct.—Mar.	2 5·7	+29 46	11 21	10 42	10 2	9 27	3·6	78	5·1, 6·7	Golden blue (8).
P. ii. 38–39 **Trianguli**	Oct.—Mar.	2 10·8	+28 13	11 26	10 47	10 7	9 32	14·1	210	6·7, 7·5	Yellow, blue.
γ **Ceti**	Oct.—Feb.	2 37·4	+ 2 45	11 53	11 13	10 34	9 59	2·8	290	3·4, 7·1	Whitish yellow, ash (8).

(1) Moving together through space.
(2) Each of the stars is itself a close pair, and there are several other companions.
(3) Rapid rectilinear motion.
(4) See January and February lists.
(5) Moving, but probably not binary.
(6) Moving together through space. Another pair in field *n.p.* 7·0, 10·1 : 340° : 20″·5. Yellow, violet.
(7) A blue 8·7 mag. at 179°·: 20″·3.
(8) Cf. January list.

DECEMBER (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Distances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	1 42	2 22	3 1	3 41	—	—	—	—
P. xxiii. 51 **Androm.**	Aug.—Feb.	23 14·2	+48 0	6 32	5 53	5 13	4 34	78·9	305	6·0, 9·0	Both yellow.
Cluster in **Cepheus**	—	23 29·3	+72 18	6 47	6 8	5 28	4 49	—	—	8–11	Scattered.
19 **Piscium**	Oct.—Jan.	23 40·6	+ 2 51	6 58	6 19	5 40	5 0	—	—	6·2	Fine orange red.
P. xxiii. 223 **Cassiop.**	Aug.—Feb.	23 47·8	+50 53	7 6	6 26	5 47	5 8	42·4	197	6·0, 9·0	White, bluish white.
Cluster in **Cassiop.**	Aug.—Mar.	23 52·9	+59 23	7 11	6 31	5 52	5 13	—	—	7–9	Stars large.
Pair in **Andromeda**	Aug.—Feb.	23 53·6	+33 6	7 11	6 32	5 53	5 13	3·0	206	6·0, 6·4	Both yellow (1).
Pair in **Cassiop.**	July—Mar.	23 56·7	+65 28	7 14	6 35	5 56	5 16	15·2	70	5·8, 7·0	Golden, ultramarine.
α **Andromedæ** *	Aug.—Feb.	0 2·5	+28 28	7 20	6 41	6 2	5 22	71·0	273	2·0, 10·4	Bluish white, purplish (2).
Pair in **Andromeda**	Aug.—Feb.	0 25·4	+32 57	7 43	7 4	6 24	5 45	56·3	85	5·3, 8·3	Reddish yellow, blue.
κ **Cassiopeiæ**	July—Mar.	0 26·5	+62 18	7 44	7 5	6 26	5 46	—	—	4·3	Surrounded by fine fields.
Pair in **Andromeda**	Aug.—Feb.	0 29·0	+36 12	7 47	7 7	6 28	5 49	11·7	312	6·5, 8·6	Reddish gold, blue.
π **Andromedæ**	Aug.—Feb.	0 30·7	+33 5	7 48	7 9	6 30	5 50	36·3	173	4·2, 8·0	White, blue.
Cluster in **Cassiop.**	July—Mar.	0 36·8	+61 10	7 54	7 15	6 36	5 56	—	—	8·5–9·5	Fine cluster.
P. o. 175-6 **Androm.**	Aug.—Feb.	0 40·2	+30 19	7 58	7 18	6 39	6 0	46·4	54	6·9, 7·0	Yellow, deeper yellow.
65 **Piscium**	Sept.—Feb.	0 43·7	+20 49	8 1	7 22	6 43	6 3	4·4	298	6·1, 6·4	Both whitish yellow.
26 **Ceti**	Sept.—Feb.	0 57·9	+ 0 46	8 15	7 36	6 57	6 18	16·0	252	6·2, 9·0	White, lilac.
ψ^1 **Piscium**	Sept.—Feb.	0 59·5	+20 51	8 17	7 38	6 58	6 19	30·0	160	4·7, 4·9	Both greenish yellow (3).
σ^2 **Piscium**	Aug.—Feb.	0 59·9	+31 34	8 17	7 38	6 59	6 20	56·0	294	6·2, 9·5	Deep yellow, blue (4).
Pair in **Pisces**	Aug.—Feb.	1 6·4	+31 28	8 24	7 45	7 5	6 26	19·6	249	6·7, 8·0	White, blue.
Pair in **Cassiop.**	July—Mar.	1 29·8	+58 3	8 47	8 8	7 29	6 49	24·7	75	6·5, 7·7	Green, red.
Nebula in **Perseus**	July—Mar.	1 35·1	+60 1	8 53	8 13	7 34	6 55	—	—	—	White, elliptical (5).
Red star in **Cassiop.**	—	1 47·4	+69 38	9 5	8 26	7 46	7 7	—	—	7·0	Fine red.
λ **Arietis**	Oct.—Mar.	1 51·6	+23 2	9 9	8 30	7 50	7 11	37·9	46	4·5, 7·0	White, olive blue.
α **Piscium**	Oct.—Feb.	1 56·1	+ 2 13	9 14	8 34	7 55	7 16	3·0	323	4·1, 5·4	Green, ashy green (6).

(1) In slow movement.
(2) Change, owing to proper motion of α.
(3) A 10 mag. star in 121°·7 : 98″·2.
(4) A 9·9 mag. at 234° : 138″·4.
(5) Double nebula, the *s. p.* a little the brighter.
(6) Probably slow binary.

DECEMBER (*Mean Time of Transit at Greenwich*).

Name of Object	Visible	R.A.	Decl.	1	11	21	31	Dis-tances	Posit. Angles	Mag.	Colours and Remarks
		h. m.	° ′	h. m.	h. m.	h. m.	h. m.	″	°		
Sidereal time at 9 P.M.	—	—	—	1 42	2 22	3 1	3 41	—	—	—	—
Nebula in **Cetus**	Oct.—Feb.	2 21·8	− 1 39	9 39	9 0	8 21	7 41	—	—	—	Round, bluish white. 80″ diam.
33 **Arietis**	Oct.—Mar.	2 34·0	+26 35	9 51	9 12	8 33	7 53	28·6	360	5·2, 9·3	Yellowish white, red purple.
P. ii. 220 **Persei**	Sep.—Mar.	2 52·7	+51 54	10 10	9 31	8 51	8 12	12·2	85	5·0, 6·5	Whitish yellow, ashy green.
Pair in **Perseus**	Oct.—Mar.	2 54·5	+31 58	10 12	9 32	8 53	8 14	8·8	8	6·2, 8·0	Reddish yellow, blue.
Pair in **Taurus**	Nov.—Mar.	3 21·4	+20 4	10 39	9 59	9 20	8 41	6·9	162	6·3, 7·5	White, ashy blue.
Pair in **Camelopardus**	Oct.—Mar.	3 24·3	+58 23	10 41	10 2	9 23	8 44	20·3	242	6·0, 7·5	Yellowish white, blue.
Pair in **Taurus**	Nov.—Mar.	3 24·4	+27 11	10 42	10 2	9 23	8 44	11·3	270	6·1, 6·7	Both white (1).
Cluster in **Perseus**	Sep.—Mar.	3 25·5	+51 2	10 43	10 3	9 24	8 45	—	—	8–9	Not very rich.
Pair in **Taurus**	Nov.—Mar.	3 34·4	+ 4 46	10 52	10 12	9 33	8 54	26·2	56	5·6, 9·0	Orange, bluish white (2).
Pair in **Perseus**	Nov.—Mar.	3 54·0	+38 21	11 11	10 32	9 52	9 13	19·2	285	6·7, 8·2	Yellow, blue
Pair in **Taurus**	Nov.—Mar.	4 1·2	+14 51	11 18	10 39	10 0	9 20	3·8	222	6·0, 8·5	White, blue.
Nebula in **Eridanus**	Dec.—Feb.	4 9·0	−13 1	11 26	10 47	10 7	9 28	—	—	—	Planetary, light blue (3).
39 **Eridani**	Dec.—Feb.	4 9·0	−10 32	11 26	10 47	10 7	9 28	6·5	151	5·5, 8·7	Deep yellow, turquoise.
o^2 **Eridani***	Dec.—Feb.	4 10·0	− 7 49	11 27	10 48	10 8	9 29	81·0	106	4·0, 9·7	Orange, blue (4).
δ **Tauri**	Nov.—Mar.	4 18·8	+17 39	11 36	10 57	10 17	9 38	76·8	233	3·6, 9·2	Yellow, whitish blue.
Pair in **Taurus**	Nov.—Mar.	4 21·6	+30 7	11 39	10 59	10 20	9 41	14·5	36	6·2, 7·7	Yellow, deep blue.
57 **Persei**	Oct.—Apr.	4 25·4	+42 49	11 42	11 3	10 24	9 44	113·7	199	5·5, 6·5	Yellow, white.
62 **Eridani**	Dec.—Feb.	4 50·8	− 5 21	12 8	11 28	10 49	10 10	63·8	74	6·0, 7·5	White, lilac (5).
Red star in **Orion**	Dec.—Mar.	4 59·5	+ 1 1	12 16	11 37	10 58	10 18	—	—	6·0	Pale ruby.
Pair in **Auriga**	Nov.—Apr.	5 2·5	+27 54	12 19	11 40	11 1	10 21	11·8	27	5·8, 8·0	White, reddish blue.
κ **Leporis**	Dec.—Mar.	5 8·0	−13 5	12 25	11 46	11 6	10 27	2·4	358	5·2, 7·7	White, ash.
Pair in **Auriga**	Oct.—Apr.	5 17·6	+34 45	12 34	11 55	11 16	10 37	31·2	346	6·3, 7·8	Deep yellow, deep blue.
Pair in **Orion**	Dec.—Mar.	5 17·9	− 8 32	12 35	11 55	11 16	10 37	6·0	143	6·5, 8·0	White, sky blue (6).
θ^1 **Orionis** and Nebula	Dec.—Mar.	5 29·7	− 5 28	12 47	12 7	11 28	10 49	—	—	—	The Gt. Neb. and Trapezium (7).

(1) Fine field; a pair 10′ *n. p.*, 6·9, 7·4 : 233° : 44″·1, white.
(2) A 9·4 mag. in 301° : 37″·7.
(3) Several stars in field, two 7 mag. ones *s. p.*
(4) 9·7 is a difficult close unequal pair, binary, with period about 200 years (?). Both stars have the same large proper motion as o^2, and form a ternary system. The distance of o^2 Eridani from the solar system is about 1,000,000 times that of the Earth from the Sun.
(5) A 9·5 mag. *n. p.*
(6) $8^m\frac{3}{4}$ *f.*, 11′ south of Rigel.
(7) See January and February lists. "Circumsitæ nebulæ descriptio 'res Deo improba,'" (d'Arrest).

CIRCUMPOLAR OBJECTS.

Name of Object	R.A.	Decl.	Distances	Posit. Angles	Mags.	Colours and Remarks
	h. m.	° ′	″	°		
Pair in **Cepheus** .	0 7·7	+75 24	77·1	102	6·4, 7·1	Yellow, whitish yellow.
Cluster in **Cepheus** .	0 33·9	+84 42	—	—	9-11·5	Very large, 150-200 stars.
α **Ursæ Min.** (*Polaris*) .	1 17·0	+88 42	18·3	214	2·0, 8·4	Yellowish white, blue (1).
Pair in **Cepheus** .	1 44·9	+75 39	3·2	247	7·0, 7·7	Both white.
Pair in **Cassiopeia** .	1 52·9	+73 17	5·6	191	6·0, 9·0	White, blue.
47 **Cassiopeiæ** . .	1 53·7	+76 44	95·1	196	4·7, 9·2	White, blue.
Pair in **Cepheus** .	1 59·7	+79 9	55·8	275	6·1, 6·8	Both white.
P. ii. 191 **Cephei** * . .	2 50·9	+78 57	4·5	230	5·4, 9·4	Golden, blue.
P. iv. 269 **Camelopardi** .	5 3·5	+79 6	17·6	5	4·8, 8·3	Light yellow, blue (2).
Pair in **Camelopardus**	6 48·7	+75 24	12·0	28	7·0, 8·0	Yellow, deep blue.
Red star in **Camelop.**.	7 7·1	+82 38	—	—	5·5	Light red.
Pair in **Camelopardus**	8 7·5	+72 46	43·9	86	5·7, 9·2	Yellow, blue.
Nebula in **Camelop.** .	8 40·6	+78 39	—	—	—	Pretty bright, long.
Pair in **Ursa Maj.** .	9 27·0	+73 36	4·9	134	6·8, 7·1	Both white.
Red star in **Camelop.**.	11 54·4	+81 29	—	—	6·2	Fine orange.
Pair in **Camelopardus**	12 5·8	+82 21	65·1	76	6·0, 8·0	Orange, deep blue.
Pair in **Camelopardus**	12 11·2	+80 46	14·3	218	6·0, 7·0	Both white.
Pair in **Camelopardus**	12 48·1	+84 3	21·8	327	4·5, 5·0	Whitish yel., bluish white.
π^1 **Ursæ Min.** . .	15 36·1	+80 52	30·6	82	6·1, 7·0	Yellow, bluish white (3).
ψ **Draconis** . . .	17 44·0	+72 12	30·9	15	4·1, 5·2	Yellow, lilac (4).
40, 41 **Draconis** . .	18 8·6	+79 59	20·3	235	5·4, 5·8	Both yellow (5).
Pair in **Draco** . .	18 57·4	+75 38	5·7	219	6·5, 7·2	Both white.
Red star in **Draco** .	19 25·6	+76 20	—	—	6·5	Fine red. Var.?
κ **Cephei** . . .	20 12·7	+77 22	7·4	123	4·5, 8·1	White, violet.
Pair in **Cepheus** .	22 2·4	+82 19	13·6	75	6·1, 6·9	Yellow, bluish yellow.

(1) The companion was seen in sunlight by Struve with the Dorpat refractor of 9·6-in. aperture, February 9, 1826. Distance of Polaris two million two hundred and seventy thousand times greater than that of the Earth from the Sun.

(2) In rapid motion, possibly orbital?
(3) Moving together through space.
(4) Moving together through space.
(5) A 7 mag., lilac, in field, about 3½′ *s. f.*

DAILY ACCELERATION OF SIDEREAL ON MEAN TIME.

day	h. m.	days	h. m.	days	h. m.	days	h. m.	days	h. m.	days	h. m.	days	h. m.	days	h. m.	days	h. m.
1	0 4	12	0 47	23	1 30	34	2 14	44	2 53	54	3 32	64	4 12	74	4 51	84	5 30
2	0 8	13	0 51	24	1 34	35	2 18	45	2 57	55	3 36	65	4 16	75	4 55	85	5 34
3	0 12	14	0 55	25	1 38	36	2 22	46	3 1	56	3 40	66	4 19	76	4 59	86	5 38
4	0 16	15	0 59	26	1 42	37	2 25	47	3 5	57	3 44	67	4 23	77	5 3	87	5 42
5	0 20	16	1 3	27	1 46	38	2 29	48	3 9	58	3 48	68	4 27	78	5 7	88	5 46
6	0 24	17	1 7	28	1 50	39	2 33	49	3 13	59	3 52	69	4 31	79	5 11	89	5 50
7	0 28	18	1 11	29	1 54	40	2 37	50	3 17	60	3 56	70	4 35	80	5 15	90	5 54
8	0 31	19	1 15	30	1 58	41	2 41	51	3 21	61	4 0	71	4 39	81	5 18	91	5 58
9	0 35	20	1 19	31	2 2	42	2 45	52	3 24	62	4 4	72	4 43	82	5 22	92	6 2
10	0 39	21	1 23	32	2 6	43	2 49	53	3 28	63	4 8	73	4 47	83	5 26	93	6 6
11	0 43	22	1 26	33	2 10												

OBJECTS SUITABLE FOR FOUR TO SEVEN-INCH TELESCOPES.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
34 **Piscium** . . .	Dec.—Feb.	0 4·2	+10 31	7·8	160	5·9, 10·2
26 **Andromedæ** . .	Aug.—Feb.	0 12·7	+43 9	5·9	240	6·0, 10·1
42 **Piscium** . . .	Dec.—Feb.	0 16·5	+12 51	29·7	338	6·6, 11·0
12 **Ceti**	Dec.—Feb.	0 24·2	− 4 35	8·6	187	6·0, 10·9
P. O. 245 **Piscium** . .	Oct.—Feb.	0 52·3	+20 47	0·75*	93	6·7, 8·2
P. i. 11 **Piscium** . .	Sept.—Feb.	1 6·7	+29 28	10·6	258	6·0, 10·0
ϕ **Piscium** . . .	Oct.—Feb.	1 7·5	+23 59	7·7	227	5·2, 10·0
42 **Ceti** (1) . . .	Dec.—Feb.	1 14·0	− 1 6	1·45	355	6·7, 7·5
ψ **Cassiopeiæ** (2) .	Aug.—Feb.	1 17·9	+67 32	28·7	107	4·5, 9·7
P. i. 123 **Piscium** (3) .	Nov.—Feb.	1 30·1	+ 7 4	1·33	33	7·2, 7·4
103 **Piscium** (4) . .	Nov.—Feb.	1 33·1	+16 3	1·31	297	6·9, 9·0
ϵ **Trianguli** . .	Nov.—Feb.	1 56·3	+32 44	4·0	118	5·6, 10·8
48 **Cassiopeiæ** . .	July—Mar.	1 52·6	+70 21	0·96	267	5·0, 7·0
10 **Arietis** (5) . . .	Nov.—Feb.	1 57·1	+25 23	1·04	50	5·8, 8·0
P. ii. 96 **Arietis** . .	Nov.—Mar.	2 23·9	+24 44	12·1	182	6·3, 10·7
γ **Ceti**	Dec.—Mar.	2 29·9	+ 5 6	7·8	84	5·0, 9·9
Pair in **Cetus** . .	Dec.—Mar.	2 35·0	+ 4 24	1·71	295	7·0, 8·9
84 **Ceti** (5) . . .	Dec.—Mar.	2 35·4	− 1 10	4·7	324	5·8, 9·6
θ **Persei** (6) . .	Sept.—Mar.	2 36·4	+48 45	17·2	299	4·2, 9·8
Pair in **Perseus** . .	Oct.—Mar.	2 40·1	+35 6	1·53	161	6·3, 8·7
π **Arietis** . . .	Dec.—Mar.	2 42·9	+17 0	3·3, 25·2	122, 109	5·5, 8·2, 11·0
41 **Arietis** . . .	Dec.—Mar.	2 43·4	+26 48	21·2, 34·0	266, 204	4·1, 11·3, 11·0
Pair in **Cepheus** .	—	2 50·9	+78 58	4·5	230	5·4, 9·4
ϵ **Arietis** (7) . .	Dec.—Mar.	2 52·6	+20 54	1·39	201	5·4, 6·3
50 **Arietis** . . .	Dec.—Mar.	2 54·1	+17 33	2·1	67	7·1, 9·9
ρ^2 **Eridani** (8). . .	Dec.—Feb.	2 57·1	− 8 8	2·5	85	5·4, 9·5
Pair in **Cassiopeia** (9)	Aug.—Apr.	3 1·3	+71 7	0·98	213	7·0, 7·0
12 **Eridani** (10) . .	Dec.—Jan.	3 7·2	−29 27	2·6	312	4·0, 9·5
τ^4 **Eridani** (11) . .	Dec.—Jan.	3 14·5	−22 11	5·4	287	5·0, 9·5
Pair in **Perseus** . .	Nov.—Mar.	3 17·3	+33 8	3·9	153	6·4, 9·9

(1) Binary.
(2) 9·7 is double, 10·6 : 256° : 3″·1.
(3) Slow binary; a 10·0 mag. at 71° : 77″·3.
(4) *n. p.*, 105 Piscium; in the same field.
(5) Moving together through space.
(6) Moving together through space; a 9·0 mag. at 218° : 69″·2, not connected with the system of θ Persei.
(7) Binary.
(8) 9·5 variable.
(9) Binary, an 11·6 mag. in 307° : 20″.
(10) Sometimes called α Fornacis. Very rapid common proper motion.
(11) A 10·5 at 100° : 40″·0; a 10·7 at 293° : 123″·0; a 10·7 at 276° : 130″·0; and a 10·0 at 236° : 160″·1.

* Distances under 2″·0 are given in this list to the nearest hundredth of a second of arc.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
2 (*Hevel*) **Camelopardi**	Oct.—Mar.	3 19·8	+59 32	2·2	163	4·9, 8·5
ζ **Persei** (1) . . .	Nov.—Mar.	3 47·0	+31 32	12·8, 32·6	208, 287	3·0, 8·7, 11·1
9 (*Hevel*) **Camelopardi**	Oct.—Apr.	3 47·4	+60 46	2·2	41	5·2, 8·2
30 **Eridani** . . .	Dec.—Feb.	3 47·1	− 5 42	8·2	135	6·5, 10·5
Pair in **Perseus** . .	Nov.—Mar.	3 49·5	+41 33	8·8	149	6·7, 9·7
Pair in **Cepheus** (2) .	—	3 50·9	+80 23	0·96	35	5·7, 7·0
Pair in **Perseus** . .	Nov.—Mar.	3 52·1	+38 29	1·60	329	6·2, 9·7
Pair in **Perseus** (3) .	Nov.—Mar.	3 59·7	+33 9	1·08	204	6·7, 9·0
P. iii. 242 **Persei** (4) .	Nov.—Mar.	4 0·0	+37 47	2·7	138	6·8, 9·5
P. iv. 53 **Tauri** . .	Nov.—Mar.	4 15·7	+20 30	2·1	171	5·6, 8·8
56 **Persei** . . .	Nov.—Mar.	4 17·2	+33 42	4·4	56	5·5, 9·2
2 **Camelopardi** . .	Nov.—Apr.	4 30·9	+53 15	1·62	292	5·8, 7·5
7 **Camelopardi** (5) .	Nov.—Apr.	4 48·2	+53 34	1·24, 25·7	309, 239	4·6, 7·9, 11·0
5 **Aurigæ** . . .	Oct.—Apr.	4 52·5	+39 13	2·7	247	6·0, 9·7
14 **Orionis** . . .	Dec.—Mar.	5 1·6	+ 8 20	1·15	203	5·8, 6·0
16 **Aurigæ** (6) . .	Nov.—Apr.	5 10·7	+33 15	4·3	57	5·0, 10·6
Leporis 28 . .	Dec.—Feb.	5 15·7	−21 22	4·3	283	6·0, 10·5
Pair in **Orion** . .	Dec.—Mar.	5 18·6	− 0 59	1·43	171	6·5, 6·7
η **Orionis** . . .	Dec.—Mar.	5 18·7	− 2 30	1·00	85	4·0, 6·0
ψ^2 **Orionis** . . .	Dec.—Mar.	5 20·8	+ 2 59	2·7	324	5·4, 9·0
β **Leporis** . . .	Dec.—Feb.	5 23·4	−20 51	2·5	285	3·5, 11·0
31 **Orionis** . . .	Dec.—Mar.	5 23·9	− 1 11	12·6	88	5·4, 10·5
33 **Orionis** . . .	Dec.—Mar.	5 25·2	+ 3 12	1·76	28	6·0, 7·0
Pair in **Taurus** . .	Nov.—Mar.	5 30·1	+26 52	1·06	178	6·5, 7·0
42 **Orionis** . . .	Dec.—Mar.	5 29·8	− 4 55	1·73	218	5·2, 8·9
Pair in **Camelopardus**	Nov.—Apr.	5 37·5	+62 46	1·54	23	6·4, 7·3
Pair in **Orion** . .	Nov.—Mar.	5 41·5	+20 50	0·85, 75·6	315, 161	6·2, 8·0, 7·5
52 **Orionis** . . .	Dec.—Mar.	5 41·9	+ 6 25	1·61	204	6·1, 6·5
Leporis 61 . .	Dec.—Feb.	5 44·4	−14 31	2·7	179	6·0, 9·4
θ **Aurigæ** (7). . .	Nov.—Mar.	5 52·0	+37 12	2·4	359	3·0, 8·6
3 **Monocerotis** . .	Dec.—Mar.	5 56·5	−10 36	1·62	355	6·0, 9·7
Pair in **Auriga** . .	Nov.—Mar.	5 59·7	+36 17	1·73	277	7·0, 10·0
4 **Monocerotis** . .	Dec.—Mar.	6 3·1	−11 7	3·2, 9·0	178, 244	6·7, 10·5, 11·5
Pair in **Monoceros** .	Dec.—Mar.	6 6·1	− 4 38	0·98	170	6·2, 8·7
4 **Lyncis** . . .	Nov.—May	6 11·9	+59 25	0·95	101	6·2, 7·5
Pair in **Camelopardus**	—	6 15·3	+70 36	5·5	79	6·0, 10·9
Pair in **Monoceros** .	Jan.—Apr.	6 16·1	−11 42	3·8	26	6·2, 9·9
54 **Aurigæ** . . .	Jan.—Apr.	6 32·4	+28 22	0·83	37	6·0, 8·0
15 **Monocerotis** (8) .	Jan.—Apr.	6 34·7	+10 0	3·0, 16·9	211, 13	Var. 8·7, 11·0
Canis Maj. 29 . .	Feb.—Apr.	6 43·8	−15 1	0·97	290	6·0, 8·7

(1) A 9·3 at 198°, 89″ 1, and a 10·0 at 185° : 119″·5.
(2) Binary.
(3) A 12·5 mag. at 119° : 34″·7.
(4) Rapid common proper motion, in which 50 Persei, 12′ distant, joins. Parallax insensible.
(5) 8·7 mag. of a very dusky hue.
(6) A pair with double companion in field, 32^s *f.* and 10′ north of 16.
(7) 8·6 possibly variable. Several faint distant companions.
(8) In the midst of a scattered cluster, containing several pairs.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
15 **Lyncis** (1) . .	Nov.—May	6 47·4	+58 35	0·73	360	5·0, 7·3
λ **Geminorum** . .	Dec.—Apr.	7 11·5	+16 44	9·5	33	3·5, 9·8
P. vii. 52 **Canis Minor** .	Dec.—Apr.	7 11·5	+ 9 30	1·28	113	7·0, 7·0
30 **Canis Maj.** . .	Jan.—Mar.	7 14·0	−24 45	7·8, 14·3	90, 80	6·0, 10·5, 11·2
P. vii. 116 **Monocerotis**.	Jan.—Apr.	7 22·5	−11 20	0·80, 2·0, 23·4	166, 313, 157	6·0, 8·2, 8·9, 10·0
Pair in **Gemini** . .	Dec.—May	7 27·9	+31 12	0·82	332	5·5, 6·5
π **Geminorum** . .	Dec.—May	7 40·1	+33 42	22·0	212	5·0, 10·8
Pair in **Canis Minor**.	Dec.—May	7 46·7	+ 3 41	1·20	43	7·0, 7·2
Pair in **Cancer** . .	Dec.—May	7 54·2	+23 54	2·7	333	6·1, 10·7
11 **Cancri** . . .	Dec.—May	8 1·8	+27 49	3·2	218	6·9, 10·4
Pair in **Lynx** . .	Dec.—June	8 7·0	+43 23	4·2	294	6·7, 10·5
Pair in **Argo** (2) . .	Feb.—May	8 34·0	−19 20	4·3	104	6·5, 10·5
Pyxidis 17 . .	Feb.—May	8 34·2	−22 17	1·37	34	6·0, 9·0
ι^2 **Cancri** . . .	Dec.—May	8 47·3	+31 1	1·42	328	5·8, 6·2
ι **Ursæ Maj.** (3) . .	Dec.—June	8 51·4	+48 29	9·6	357	3·2, 10·2
σ^2 **Ursæ Maj.** (4) . .	Dec.—June	9 0·4	+67 36	2·4	233	5·1, 8·7
37 **Lyncis** . . .	Dec.—June	9 12·8	+51 44	5·5	117	6·0, 10·6
κ **Leonis** . . .	Dec.—May	9 18·0	+26 41	3·4	205	5·0, 10·2
ω **Leonis** (5) . . .	Jan.—June	9 22·4	+ 9 33	0·68	100	6·0, 6·4
3 **Leonis** . . .	Jan.—June	9 22·4	+ 8 41	25·1	79	6·0, 10·8
Pair in **Leo**. . .	Jan.—June	9 32·6	+11 17	8·3	103	6·7, 10·2
Felis 15 . . .	Mar.—June	9 36·2	−17 58	3·1	261	7·2, 11·0
P. x. 23 **Leonis** . .	Feb.—June	10 10·0	+18 18	0·76	217	6·5, 7·5
Felis 54 . . .	Mar.—June	10 16·2	−21 58	2·0	189	6·5, 9·0
P. x. 94 **Sextantis** . .	Mar.—June	10 25·3	− 7 3	2·8	166	6·0, 9·9
Pair in **Ursa Maj.** .	Feb.—June	10 41·5	+41 42	0·84	330	6·5, 7·5
ψ **Crateris** . . .	Apr.—June	11 6·9	−17 53	0·45	149	6·2, 6·9
ν **Ursæ Maj.** . .	Feb.—June	11 12·3	+33 43	7·0	147	3·8, 9·6
γ **Crateris** (6) . .	Apr.—June	11 19·2	−17 4	5·1	98	4·0, 10·0
Pair in **Ursa Maj.** (7).	Apr.—Aug.	11 25·8	+61 43	1·26	65	6·3, 7·7
P. xi. 126 **Virginis**. .	Mar.—June	11 32·6	− 1 48	4·9	279	6·2, 9·7
Pair in **Can. Ven.** .	Mar.—June	11 50·4	+36 5	1·55	122	6·5, 9·0
Pair in **Can. Ven.** .	Mar.—June	12 5·0	+40 32	1·21	338	6·2, 7·0
Pair in **Comæ Ber.** .	Mar.—June	12 11·8	+29 34	8·2	277	6·2, 10·5
P. xii. 104 **Corvi** . .	Apr.—June	12 24·2	−12 45	1·81	354	6·2, 10·2
Pair in **Corvus** . .	Apr.—June	12 29·8	−16 12	11·2	258	6·7, 11·2
35 **Comæ Ber.** (8) . .	Apr.—July	12 47·7	+21 52	1·37, 28·8	68, 125	5·2, 8·0, 9·2
46 **Virginis** . . .	Apr.—June	12 54·7	− 2 45	1·44	151	5·4, 9·5
Hydræ 348 . .	Apr.—June	12 57·6	−19 58	0·71	133	6·2, 6·2
P. xii. 268 **Can. Ven.** .	Apr.—June	13 0·7	+29 38	6·5, 40·3	219, 7	6·0, 10·5, 12·5

(1) Binary.
(2) Red, blue.
(3) Very large common proper motion, in which a neighbouring star, 10 Ursæ, participates.
(4) Binary, closing rapidly.
(5) Binary, period about 115 years.
(6) Common proper motion.
(7) Binary, period 94½ years.
(8) Binary.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
Pair in **Can. Ven.** (1).	Apr.—June	13 6·7	+32 41	1·41	348	6·3, 6·9
25 **Can. Ven.** (2) . .	Apr.—June	13 32·4	+36 52	0·80	151	6·2, 8·2
τ **Boötis** (3) . .	Apr.—June	13 41·8	+18 1	8·9	353	4·1, 11·5
P. xiii. 242 **Can. Ven.** .	Apr.—June	13 49·3	+30 28	1·81	18	7·0, 9·6
Pair in **Boötes** . .	Apr.—June	14 1·8	+35 19	14·2	70	6·4, 10·0
P. xiv. 20 **Boötis** . .	May—July	14 8·3	+12 31	1·95	249	6·6, 9·3
ϕ **Virginis** . . .	May—July	14 22·3	− 1 43	4·1	112	5·2, 9·4
Pair in **Boötes** . .	May—Aug.	14 28·5	+49 41	5·0	131	7·2, 11·0
Pair in **Boötes** . .	May—Aug.	14 36·3	+49 11	7·0	102	7·3, 11·0
Libræ 23 . . .	May—June	14 42·1	−16 52	1·27	236	7·0, 8·0
Pair in **Boötes** . .	May—July	14 43·4	+24 50	1·50	55	6·3, 7·4
Pair in **Boötes** . .	May—July	14 48·0	+16 10	1·49	195	6·2, 7·2
Pair in **Boötes** . .	May—July	14 51·3	+32 45	4·3	113	6·2, 10·5
Pair in **Boötes** . .	May—Aug.	15 10·6	+38 44	1·38	257	6·2, 8·2
Pair in **Libra** (4) .	May—July	15 12·5	−23 51	1·90	180	7·0, 9·0
5 **Serpentis** (5) . .	May—July	15 13·4	+ 2 13	10·7	38	4·8, 10·0
Coronæ 1 (6) . .	May—July	15 13·5	+27 15	1·22	308	5·6, 6·1
6 **Serpentis** . . .	May—July	15 15·2	+ 1 8	2·3	13	4·7, 9·4
η **Coronæ Bor.** (7) .	May—Aug.	15 18·5	+30 42	0·65	182	5·7, 6·0
μ^2 **Boötis** (8) . . .	May—Aug.	15 20·3	+37 45	0·78	104	6·5, 7·8
2 **Scorpionis** . .	May—June	15 46·7	−25 0	2·6	279	5·5, 9·0
11 **Scorpionis** . .	May—July	16 1·3	−12 26	3·3	256	6·1, 10·4
Pair in **Cor. Bor.** .	May—Aug.	16 7·3	+33 38	5·4	262	6·0, 10·5
Pair in **Cor. Bor.** .	May—July	16 8·0	+26 58	2·8	136	6·2, 10·7
Pair in **Serpens** .	May—July	16 16·0	+ 1 26	2·6	1	7·2, 9·9
η **Draconis** . . .	Apr.—Aug.	16 22·4	+61 46	5·2	142	2·8, 9·0
Draconis 99 . .	Apr.—Aug.	16 22·3	+61 57	1·16	2	6·2, 7·4
Pair in **Hercules** .	May—Aug.	16 23·3	+26 15	1·26	211	6·6, 7·9
ζ **Herculis** (9) .	May—Aug.	16 37·0	+31 49	1·65	82	2·6, 7·0
Pair in **Hercules** .	May—July	16 44·3	+13 27	5·4	39	5·7, 10·3
21 **Ophiuchi** . . .	June—Aug.	16 45·6	+ 1 25	0·98	162	6·0, 8·0
52 **Herculis** . .	May—Aug.	16 46·0	+46 11	1·83	309	5·0, 10·0
P. xvi. 270 **Oph.** . .	June—Aug.	16 56·5	+ 8 36	1·28	157	6·7, 7·9
Herculis 206 (10) .	May—Aug.	16 59·8	+19 45	1·78	232	6·9, 10·2
P. xvii. 18 **Oph.** . .	June—Aug.	17 7·5	+ 7 54	1·47	204	6·7, 8·9
P. xvii. 43 **Oph.** . .	July—Aug.	17 13·2	−17 38	1·74	261	6·2, 7·5
68 **Herculis** . . .	June—Aug.	17 13·3	+33 14	4·4	61	5·1, 10·1
Pair in **Hercules** .	June—Sept.	17 42·1	+17 44	0·79	298	6·1, 7·8
Pair in **Taurus Pon.** .	June—Sept.	17 42·2	+39 22	7·6	350	6·7, 10·3
90 **Herculis** . . .	June—Sept.	17 49·6	+40 3	1·90	122	5·9, 9·4

(1) Binary.
(2) Binary, period 120 years.
(3) Large common proper motion.
(4) A pair in field, 31^s *f.*, 7½, 7¾ : 329° : 0″·80.
(5) Large common proper motion.
(6) Magnitudes possibly variable.
(7) Binary, period 41½ years.
(8) Binary, period rather uncertain.
(9) Binary, period 34½ years.
(10) Pair in field, 47^s *p.*, 5′ *n.* 6·9, 11·3 : 228° : 1″·50.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
Pair in **Hercules** .	June—Oct.	18 4·2	+49 42	2·2	148	6·4, 10·5
Herculis 417 .	June—Sept.	18 5·1	+16 27	1·19	236	6·7, 7·8
μ **Sagittarii** (1) . .	June—Aug.	18 6·9	−21 5	16·8	258	3·5, 11·0
Pair in **Scutum Sob.**	June—Aug.	18 15·7	−15 9	12·4, 1·27	220, 64	7·0, 8·2, 8·5
21 **Sagittarii** . . .	June—Aug.	18 18·6	−20 36	2·1	293	5·2, 8·0
Pair in **Lyra** . .	June—Nov.	18 32·4	+33 22	7·3	205	5·6, 10·5
Pair in **Aquila** . .	July—Oct.	18 33·0	+ 4 15	1·23	289	6·6, 9·5
Lyræ 91 . . .	June—Nov.	18 50·7	+33 49	1·86, 45·3	134, 350	6·0, 10·0, 7·3
17 **Lyræ**	June—Nov.	19 3·1	+32 20	3·7	321	5·5, 9·7
Pair in **Lyra** . .	June—Nov.	19 11·3	+27 16	0·83	156	6·6, 7·2
Pair in **Cygnus** . .	June—Nov.	19 12·3	+49 52	2·3	76	6·9, 10·4
2 **Vulpeculæ** . .	July—Nov.	19 12·9	+22 49	1·86	125	5·7, 9·5
P. xix. 108 **Drac.** . .	Feb.—Nov.	19 15·7	+63 0	1·16	337	7·0, 8·1
Pair in **Cygnus** . .	July—Dec.	19 39·0	+40 27	0·85	25	6·5, 7·9
P. xix. 263 **Cygni** . .	July—Dec.	19 39·7	+38 3	0·96	196	7·0, 8·0
δ **Cygni** (2) . . .	July—Dec.	19 41·4	+44 50	1·68	318	2·8, 7·5
π **Aquilæ** . . .	July—Oct.	19 43·4	+11 32	1·43, 31·2	117, 306	6·1, 6·7, 11·0
16 **Vulpeculæ** . .	July—Nov.	19 57·2	+24 37	0·69	95	5·7, 5·9
Cygni 153 . . .	July—Dec.	20 9·3	+51 7	4·0	81	5·9, 10·9
Pair in **Cygnus** . .	July—Dec.	20 10·4	+41 45	0·90, 11·8	172, 34	7·0, 7·6, 9·3
π **Capricorni** . .	July—Sept.	20 20·8	−18 35	3·3	145	5·1, 8·7
Pair in **Vulpecula** .	Aug.—Nov.	20 27·1	+25 24	1·16	78	6·3, 7·6
Delphini 43 . .	Aug.—Nov.	20 39·5	+11 54	1·22, 38·7	92, 34	6·4, 8·0, 12·0
13 **Delphini** . . .	Sept.—Nov.	20 42·2	+ 5 35	1·61	186	5·2, 8·9
λ **Cygni** (3) . . .	Aug.—Dec.	20 43·0	+36 4	0·65, 85·0	80, 105	5·0, 7·0, 8·7
60 **Cygni**. . . .	Aug.—Dec.	20 57·2	+45 42	2·7	165	5·5, 9·5
γ **Equulei** (4) . .	Aug.—Nov.	21 4·9	+ 9 38	2·2, 41·3	275, 10	4·3, 10·0, 12·0
P. xxi. 51 **Cephei** . .	June—Jan.	21 9·0	+59 31	1·12	226	5·9, 6·6
P. xxi. 50 **Cygni** . .	Aug.—Dec.	21 9·9	+40 41	1·40	128	6·6, 7·1
τ **Cygni** (5) . . .	Aug.—Dec.	21 10·2	+37 33	1·10	116	3·7, 7·8
Pair in **Cepheus** .	June—Jan.	21 11·6	+63 59	0·95	248	6·6, 6·9
P. xxi. 166 **Cephei** . .	June—Jan.	21 24·3	+59 16	12·2	190	6·2, 11·0
Pair in **Cepheus** .	June—Jan.	21 52·6	+64 47	1·45	246	6·0, 8·5
Pair in **Pegasus**. .	Sept.—Dec.	21 54·6	+23 24	2·9	259	6·6, 11·1
15 **Cephei** . . .	June—Feb.	22 0·6	+59 16	10·9	297	6·5, 11·0
Pair in **Pegasus**. .	Sept.—Dec.	22 8·8	+ 7 25	1·20	126	6·0, 7·7
Pair in **Cepheus** .	—	22 29·8	+69 20	0·84	265	6·5, 7·0
P. xxii. 258 **Cephei** . .	—	22 48·0	+82 33	3·6	34	5·1, 10·3
Pair in **Lacerta** . .	Sept.—Dec.	22 48·6	+44 9	1·33, 26·4	217, 354	6·0, 8·0, 10·7
Pair in **Pegasus**. .	Sept.—Dec.	22 51·2	+11 14	3·6	10	6·4, 9·1

(1) A 9·5 at 312° : 48″·3, and another at 115° : 50″·1, a 12·5 mag. at 118° : 25″·2, and an excessively faint star at 180° ± 25″; discovered by Mr. Common with 37-in. reflector. Good test for large apertures.

(2) Binary, distance constant.
(3) Binary.
(4) 4·3 and 10·0 moving together through space.
(5) Binary.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
52 **Pegasi** . . .	Sept.—Dec.	22 53·5	+11 7	1·22	213	6·0, 8·0
π **Cephei** (1) . . .	—	23 4·3	+74 46	1·31	27	4·7, 8·7
Pair in **Cassiopeia** .	Aug.—Mar.	23 5·2	+56 50	1·54	305	6·9, 9·0
96 **Aquarii** (2) . .	Oct.—Dec.	23 13·5	− 5 45	9·9	23	6·2, 11·3
P. xxiii. 101 **Cass.** (3) .	Aug.—Mar.	23 24·7	+57 55	1·38	345	5·0, 9·4
ω^2 **Aquarii** . . .	Oct.—Dec.	23 36·8	−15 10	5·7	88	5·0, 11·0
78 **Pegasi** . . .	Sept.—Jan.	23 38·3	+28 44	1·46	192	5·0, 8·1
Pair in **Pegasus**. .	Oct.—Jan.	23 39·7	+19 47	1·98	62	6·7, 9·3
Pair in **Andromeda** .	Sept.—Jan.	23 52·5	+34 23	3·4	23	6·4, 9·1
Pair in **Andromeda** .	Sept.—Jan.	23 58·7	+41 27	5·2	168	6·1, 10·0

(1) Binary.
(2) Common proper motion.
(3) An 8·0 mag. at 269° : 75″·9 is double, 7·5, 9·5 : 221° : 1″·36, with a companion, 11·6 mag. at 337° : 26″·9. The 5·0 has a 10·1 mag. companion at 115° : 43″·5, and another at 339° : 66″·9 which is itself double, having a 10 mag. star at 74° : 10″·9.

SHOOTING STARS.

Radiant Points.

Date	Radiant Point		Notes	Radiant Point	
	R.A.	Decl.		Rises	Souths
	h. m.	°			
January 2–3 . .	XV. 30	+48	Fine morning shower.*	—	8 39 A.M.
March 7 . . .	XVI. 16	+15	Formerly active.	9 51 P.M.	5 13 A.M.
April 19–20 . .	XVIII. 1	+33	*Lyrids.*	6 27 P.M.	4 8 A.M.
April 29–May 2 . .	XXI. 45	− 2	Morning shower. Max., May 2.	1 15 A.M.	7 8 A.M.
July 30–August 1 .	II. 8	+53	Fine display, 1878.*	—	5 29 A.M.
August 9–10 . .	II. 52	+56	*Perseids.* Very fine annual shower.	—	5 38 A.M.
September 1 . .	XX. 20	+54	Large meteors.* [10th max.*	—	9 36 P.M.
October 17–20 . .	VI. 0	+15	Fine annual shower.	8 47 P.M.	4 10 A.M.
November 13–14 .	X. 0	+23	Magnificent shower in 1866. *Leonids.*	10 14 P.M.	6 27 A.M.
November 19–23 .	IV. 16	+20	Long-continued shower.	4 19 P.M.	0 12 A.M.
November 27 . .	I. 40	+43	*Andromedes.* Fine display 1872–85.*	—	9 13 P.M.
December 9–12 . .	VII. 0	+32	*Geminids.* Rich shower.	4 10 P.M.	1 41 A.M.

* The radiant point of these showers is circumpolar, and never sets.

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TEST OBJECTS.

Two Inches Aperture.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
Dividing Tests		h. m.	° ′	″	°	
ϵ^1 **Lyræ**	June—Nov.	18 40·6	+39 33	3·12	16·1	4·6, 6·3
Σ 2671	May—Dec.	20 15·6	+55 2	2·89	341·2	6·0, 7·2
Σ 389	Sept.—Mar.	3 20·9	+58 58	2·71	66·5	6·4, 7·6
P. xvii. 300	June—Sept.	17 51·5	+18 21	2·65	115·1	6·9, 7·0
1 **Arietis**	Oct.—Mar.	1 43·7	+21 42	2·65	168·5	6·1, 7·0
P. xiii. 238	April—June	13 49·0	− 7 30	2·64	75·0	6·7, 7·3
81 **Virginis**	April—June	13 31·6	− 7 18	2·63	42·3	7·0, 7·3
Σ 425	Oct.—Feb.	3 32·9	+33 45	2·60	97·1	7·0, 7·1
ϵ^2 **Lyræ**	June— Nov.	18 40·6	+39 30	2·58	136·7	5·1, 5·2
μ **Draconis**	May—Oct.	17 3·0	+54 37	2·40	163·0	5·0, 5·0
Σ 899	Nov.—Feb.	3 16·1	+17 38	2·34	20·2	7·0, 7·5
Σ 2950	July—Jan.	22 46·9	+61 6	2·27	311·7	5·7, 6·9
Defining Tests						
η **Cassiop.**	Aug.—Feb.	0 42·1	+57 13	4·90	175·0	3·5, 7·3
5 **Argûs**	Dec.—April	7 42·6	−11 55	3·28	17·1	5·7, 7·5
δ **Serpentis**	May—July	15 29·4	+10 55	3·48	188·4	3·9, 5·5
12 **Aquarii**	July—Nov.	20 58·1	− 6 16	2·76	191·6	6·0, 8·0
ε **Boötis**	May—July	14 40·0	+27 33	3·02	329·5	2·5, 5·0
γ **Ceti**	Nov.—Jan.	2 37·4	+ 2 45	2·93	289·7	3·4, 7·1
Space-penetrating Tests						
α **Ursæ Min.** (*Polaris*)	—	1 17·0	+88 42	18·3	213·8	2·0, 8·4
β **Orionis** (*Rigel*)	Dec.—Mar.	5 9·2	− 8 20	9·5	201·1	1·0, 7·8
τ^1 **Aquarii**	Aug.—Nov.	22 40·7	−14 40	28·5	114·6	5·9, 9·2
11 **Aquilæ**	June—Sept.	18 53·9	+13 28	17·0	260·0	5·1, 9·0
19 **Ophiuchi**	June—Sept.	16 41·4	+ 2 16	22·3	91·9	6·0, 9·0
P. xii. 221	April—June	12 49·8	+12 7	28·6	203·0	6·8, 9·0
Camelop. 4	Aug.—Feb.	3 21·3	+55 3	14·6	159·2	5·4, 9·4
Tauri 39	Nov.—Mar.	3 34·4	+ 4 46	26·2, 37·7	55·7, 301·2	5·6, 9·0, 9·4
Camelop. 176	—	8 8·1	+72 46	43·9	85·5	5·7, 9·3
23 **Ursæ Maj.**	Dec.—June	9 22·5	+63 33	22·8	271·5	4·0, 9·2
Scut. Sob. (29)	July—Sept.	18 25·1	−10 53	12·2	236·5	6·0, 9·2
α **Cassiop.**	Aug.—Feb.	0 34·0	+55 55	62·4	279·8	2·4, 9·5

Two and a Half Inches Aperture.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
Dividing Tests						
Tauri. Pon. 75	June—Sept.	18 39·9	+ 5 22	2·22	115·3	6·2, 6·6
P. xx. 429	June—Dec.	20 54·8	+50 1	2·06	31·9	6·2, 7·0
P. o. 181	Aug.—Feb.	0 41·5	+50 50	2·05	147·4	7·0, 7·8
Cephei 287	—	23 23·1	+73 29	2·03	32·6	7·0, 8·0
85 **Lyncis**	Jan.—Apr.	8 2·3	+32 30	2·01	47·6	7·1, 7·9
Ursæ Maj. 284	Apr.—Aug.	11 32·4	+64 59	1·97	322·7	6·7, 7·7
84 **Aurigæ**	Dec.—May	6 30·6	+41 41	1·94	81·1	6·9, 7·7
Σ 2624	June—Nov.	19 59·2	+35 42	1·92, 42·3	175·5, 327·5	7·0, 7·6, 9·5
OΣ 358	June—Sept.	18 30·8	+16 53	1·88	19·4	6·5, 6·8
τ **Ophiuchi**	June—Aug.	17 56·9	− 8 11	1 84	254·5	5·0, 6·0
Σ 1116	Dec.—Apr.	7 28·1	+12 33	1·82	109·9	7·0, 7·7
Σ 1871	Apr.—July	14 37·7	+51 53	1·80	291·5	7·0, 7·3
Defining Tests						
μ **Can. Maj.**	Dec.—Mar.	6 50·9	−13 54	2·92	338·8	5·2, 8·2
38 **Lyncis**	Feb.—June	9 11·8	+37 18	2·80	239·1	4·2, 6·3
ε **Draconis**	—	19 48·6	+69 59	2·94	5·5	4·2, 7·2
κ **Leporis**	Dec.—Mar.	5 8·0	−13 5	2·41	357·4	5·2, 7·7
ε **Hydræ**	Jan.—Apr.	8 40·7	+ 6 50	3·34	228·0	3·8, 7·4
ι **Leonis**	Mar.—June	11 17·9	+11 9	2·80	63·0	4·6, 7·4
Space-penetrating Tests						
ο **Persei**	Nov.—Mar.	3 37·1	+31 55	20·0	238·4	4·5, 9·0
66 **Eridani**	Dec.—Mar.	5 1·1	− 4 49	52·5	9·4	6·0, 9·2
β **Serpentis**	May—July	15 41·0	+15 47	30·7	265·0	3·6, 9·1
33 **Arietis**	Oct.—Mar.	2 34·0	+26 35	28·6	359·6	5·2, 9·3
α **Lyræ** (*Vega*)	June—Nov.	18 33·1	+38 41	49·2	155·5	0·2, 9·5
12 **Lacertæ**	July—Nov.	22 36·4	+39 38	70·5	15·9	5·7, 9·7
P. v. 37	Nov.—Mar.	5 12·4	+20 0	9·0	203·0	6·0, 9·8
Cassiop. 63	Aug.—Feb.	0 32·4	+46 20	10·4	85·9	6·8, 9·9
θ **Virginis**	Apr.—June	13 4·0	− 4 56	7·1, 70·9	344·6, 297·1	4·9, 8·5, 10·0
18 **Libræ**	May—July	14 52·7	−10 41	19·5	38·9	6·0, 10·0
P. xix. 144	July—Oct.	19 24·5	+ 2 39	34·2	5·2	6·0, 10·0
μ **Herculis**	May—Sept.	17 42·0	+27 47	31·2	243·9	3·5, 10·0

Three Inches Aperture.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
Dividing Tests		h. m.	° ′	″	°	
33 **Orionis** . . .	Dec.—Mar.	5 25·2	+ 3 12	1·76	28·3	6·0, 7·0
12 **Lyncis** . . .	Dec.—May	6 36·2	+59 33	1·70, 8·7	126·8, 307·5	5·7, 6·4, 7·4
Σ 1333	Feb.—June	9 11·4	+35 51	1·69	42·2	6·7, 7·0
Persei 85 . . .	Aug.—Feb.	2 44·8	+52 31	1·69	301·8	6·8, 7·1
OΣ 437	July—Nov.	21 16·1	+31 58	1·64	49·3	6·0, 6·5
λ **Ophiuchi** . . .	June—Aug.	16 25·2	+ 2 14	1·65	44·5	4·4, 5·4
Cephei 83 . . .	May—Dec.	20 59·0	+56 13	1·62	349·3	6·4, 6·8
Lyncis 157 . .	Feb.—June	9 13·9	+38 41	1·59	154·8	6·8, 7·4
Σ 644	Oct.—Mar.	5 2·6	+37 9	1·58	220·9	6·8, 7·1
Σ 2744	July—Oct.	20 57·3	+ 1 5	1·54	170·0	6·3, 7·0
μ **Libræ** . . .	May—July	14 43·1	−13 41	1·51	337·4	5·2, 6·2
Ceti 187 . . .	Nov.—Feb.	1 14·3	−16 24	1·50	20·0	7·1, 7·3
Defining Tests						
o **Cephei** . . .	July—Mar.	23 13·9	+67 29	2·59	192·6	5·2, 7·6
49 **Leonis** . . .	Feb.—June	10 29·0	+ 9 14	2·39	157·5	6·2, 8·4
P. xx. 376 . . .	July—Oct.	20 50·0	+ 4 6	1·97	287·5	6·2, 7·9
70 **Ophiuchi** . . .	June—Aug.	17 59·7	+ 2 32	2·05	20·5	4·3, 6·2
84 **Virginis** . . .	Apr.—June	13 37·3	+ 4 7	3·56	234·3	5·7, 8·0
23 **Aquilæ** . . .	July—Oct.	19 12·7	+ 0 52	3·33	11·6	5·7, 9·0
Space-penetrating Tests						
59 **Aurigæ** . . .	Dec.—Apr.	6 45·2	+39 1	22·2	223·5	6·7, 10·0
λ **Geminorum** . .	Dec.—Apr.	7 11·5	+16 45	9·5	33·0	3·5, 9·8
57 **Pegasi** . . .	Sept.—Jan.	23 3·7	+ 8 4	32·8	197·8	5·2, 10·0
P. xix. 307 . . .	July—Oct.	19 46·8	+10 4	13·3	309·7	6·6, 10·2
P. xix. 128 . . .	June—Nov.	19 21·5	+19 39	23·7, 68·7	40·9, 319·9	5·1, 10·1, 9·8
ν **Ursæ Maj.** . .	Feb.—June	11 12·3	+33 43	7·0	147·3	3·5, 9·6
δ **Equulei** . . .	July—Nov.	21 9·0	+ 9 33	40·0	21·2	4·5, 10·0
5 **Serpentis** . . .	May—July	15 13·4	+ 2 13	10·7	38 0	4·8, 10·0
31 **Orionis** . . .	Dec.—Mar.	5 23·9	− 1 11	12·6	87·8	5·4, 10·5
α **Tauri** (*Aldebaran*) .	Oct.—Feb.	4 29·4	+16 17	115·0	34·2	1·1, 10·3
θ **Hydræ** . . .	Feb.—May	9 8·4	+ 2 48	52·7	175·2	4·0, 10·5
β **Delphini** . . .	July—Nov.	20 32·2	+14 12	35·5	334·2	3·5, 10·6

Three and a half Inches Aperture.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
Dividing Tests						
Σ 1884	May—July	14 43·4	+24 50	1·50	55·0	6 3, 7·4
36 Androm.	Sept.—Feb.	0 48·9	+23 1	1·46	1·5	6·0, 6·4
42 Ceti	Dec.—Feb.	1 14·0	− 1 6	1·45	355·0	6·7, 7·5
π Aquilæ	July—Oct.	19 43·4	+11 32	1·43, 31·2	117·3, 306·0	6·1, 6·7, 11·0
ι^2 Cancri	Dec.—May	8 47·3	+31 1	1·42	328·5	5·8, 6·2
OΣ 261	Apr.—July	13 6·7	+32 41	1·41	348·2	6·3, 6·9
P. xxi. 50	Aug.—Dec.	21 9·9	+40 41	1·40	127·7	6·6, 7·1
« Arietis	Dec.—Mar.	2 52·6	+20 54	1·39	201·3	5·4, 6·3
Pegasi 20	July—Oct.	21 23·3	+10 35	1·33	306·4	6·6, 6·6
P. vii. 170	Jan.—Mar.	7 34·1	+ 5 30	1·31	141·5	7·0, 7·3
Σ 1037	Jan.—Apr.	7 5·8	+27 25	1·30	310·6	6·9, 7·1
P. xvi. 270	June—Aug.	16 56·5	+ 8 36	1·29	157·0	6·7, 7·9
Defining Tests						
6 Cassiop.	Aug.—Feb.	23 43·2	+61 35	1·60	195·6	5·1, 7·6
33 Pegasi	July—Dec.	22 18·2	+20 17	2·06, 63·6	179·9, 328·6	6·1, 8·7, 8·3
ι Cassiop.	July—Mar.	2 19·7	+66 53	1·98, 7·4	262·0, 108·5	5·0, 7·5, 8·1
φ Virginis	May—July	14 22·3	− 1 43	4·09	112·6	5·2, 9·4
P. xi. 126	Mar.—June	11 32·6	− 1 48	4·92	279·5	6·2, 9·7
17 Lyræ	June—Nov.	19 3·1	+32 20	3·68	321·6	5·5, 9·7
Space-penetrating Tests						
ι Leporis	Dec.—Mar.	5 7·0	−12 0	12·6	336·2	4·5, 10·0
P. xx. 116	July—Oct.	20 18·8	+ 0 42	32·9	28·9	6·2, 10·3
θ Cancri	Jan.—Apr.	8 25·0	+18 29	60·8	60·0	5·5, 10·4
υ Cygni	June—Nov.	21 13·2	+34 25	15·1, 21·3	220·0, 178·5	4·3, 10·3, 10·2
α Androm.	Sept.—Feb.	0 2·5	+28 28	71·0	273·0	2·0, 10·4
13 Lacertæ	July—Nov.	22 39·0	+41 13	14·7	129·4	5·1, 10·4
5 Lyncis	Dec.—May	6 16·9	+58 29	30·3, 95·9	139·1, 272·5	6·0, 10·5, 8·5
γ Persei	Aug.—Feb.	2 56·5	+53 3	57·7	323·7	3·1, 10·8
49 Piscium	Sept.—Feb.	0 24·9	+15 24	16·7	105·8	7·0, 10·8
π Geminorum	Jan.—Apr.	7 40·1	+33 42	22·0, 95·0	211·6, 340·0	5·0, 10·8, 10·5
56 Herculis	May—Aug.	16 50·3	+25 55	18·0	93·1	6·0, 10·9
44 Virginis	Apr.—June	12 53·8	− 3 12	20·9	54·6	5·8, 11·0

Four Inches Aperture.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
DIVIDING TESTS		h. m.	° ′	″	°	
P. vii. 52	Dec.—Apr.	7 11·5	+ 9 30	1·28	113·5	7·0, 7·0
ξ Scorp.	May—July	15 58·1	−11 4	1·27, 7·3	195·7, 66·0	5·0, 5·4, 7·2
Σ 2049	May—Aug.	16 23·3	+26 15	1·26	210·9	6·6, 7·9
Cor. Bor. 1	May—July	15 13·5	+27 15	1·22	308·1	5·6, 6·1
Σ 1606	Mar.—June	12 5·0	+40 32	1·21	338·1	6·2, 7·0
0Σ 182	Dec.—Apr.	7 46·7	+ 3 41	1·20	43·2	7·0, 7·2
Pegasi 148	Sept.—Dec.	22 8·8	+ 7 25	1·20	125·6	6·0, 7·7
Herculis 417	June—Sept.	18 5·1	+16 27	1·19	236·0	6·7, 7·8
Draconis 99	May—Oct.	16 22·3	+61 57	1·16	2·0	6·2, 7·4
14 Orionis	Dec.—Mar.	5 1·6	+ 8 20	1·15	203·3	5·8, 6·0
Tauri Pon. 9	June—Aug.	17 51·2	+ 0 5	1·12	274·5	6·7, 7·0
P. xxi. 51	June—Jan.	21 9·0	+59 31	1·12	226·3	5·9, 6·6
DEFINING TESTS						
π Arietis	Dec.—Mar.	2 42·9	+17 0	3·29, 25·2	122·5, 109·9	5·5, 8·2, 11·0
ζ Herculis	May—Aug.	16 37·0	+31 49	1·65	82·0	2·6, 7·0
δ Cygni	July—Dec.	19 41·4	+44 50	1·68	318·5	2·8, 7·5
ψ² Orionis	Dec.—Mar.	5 20·8	+ 2 59	2·66	324·4	5·4, 9·0
5 Aurigæ	Oct.—Apr.	4 52·4	+39 13	2·75	246·8	6·0, 9·7
η Draconis	Apr.—Aug.	16 22·4	+61 46	5·26	142·1	2·8, 9·0
SPACE-PENETRATING TESTS						
ν¹ Cor. Bor.	May—Aug.	16 18·2	+33 58	66·4	236·6	5·1, 10·5
5 Ursæ Min.	—	14 27·8	+76 12	56·4	129·4	4·8, 10·5
3 Leonis	Jan.—June	9 22·4	+ 8 41	25·1	79·2	6·0, 10·8
ι Ursæ Maj.	Jan.—June	8 51·4	+48 29	9·6	356·7	3·2, 10·2
41 Arietis	Dec.—Mar.	2 43·4	+26 48	21·2, 34·0	265·8, 203·5	4·1, 11·3, 11·0
2 Lacertæ	Aug.—Dec.	22 16·4	+45 58	48·2	9·7	5·0, 10·9
P. i. 145	Oct.—Feb.	1 34·9	+25 10	10·9	33·3	6·1, 10·9
42 Piscium	Dec.—Feb.	0 16·5	+12 51	29·7	338·1	6·6, 11·0
54 Ophiuchi	June—Aug.	17 29·1	+13 15	21·6	74·7	6·0, 11·0
κ Andromedæ	Aug.—Feb.	23 34·8	+43 42	46·6, 103·2	188·7, 294·6	4·0, 11·0, 11·0
γ Libræ	May—July	15 29·1	−14 25	41·3	151·8	4·5, 11·3
Lyncis 51	Dec.—Apr.	7 20·5	+48 26	16·9	94·3	6·2, 11·2

Five Inches Aperture.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
Dividing Tests						
Vulpec. 94	Aug.—Nov.	20 27·1	+25 24	1·16	78·1	6·3, 7·6
Σ 115	Aug.—Feb.	1 16·1	+57 33	1·06	149·8	7·0, 7·0
Σ 749	Nov.—Mar.	5 30·1	+26 52	1·06	177·6	6·5, 7·0
η Orionis	Dec.—Mar.	5 18·7	− 2 30	1·00	84·6	4·0, 6·0
0Σ 313	May—Sept.	16 28·7	+40 21	0·99	151·6	7·0, 7·6
21 Oph.	June—Aug.	16 45·6	+ 1 25	0·98	162·7	6·0, 8·0
0Σ 50	Aug.—Apr.	3 1·3	+71 7	0·98	213·4	7·0, 7·0
ε Equulei	July—Nov.	20 53·4	+ 3 51	0·97, 10·5	285·6, 72·9	6·1, 6·8, 7·4
P. xix. 263	July—Dec.	19 39·8	+39 2	0·96	196·2	7·0, 8·0
48 Cephei	—	3 50·9	+80 23	0·96	35·0	5·7, 7·0
4 Lyncis	Nov.—May	6 11·9	+59 25	0·95	101·2	6·2, 7·5
A.C. 12	July—Oct.	19 52·4	− 2 34	0·93	332·4	7·0, 8·0
Defining Tests						
ω² Aquarii	Oct.—Dec.	23 36·8	−15 10	5·68	87·8	5·0, 11·0
42 Orionis	Dec.—Mar.	5 29·8	− 4 55	1·73	217·7	5·5, 9·2
13 Delphini	Sept.—Nov.	20 42·2	+ 5 35	1·61	186·4	5·2, 8·9
60 Cygni	Aug.—Dec.	20 57·2	+45 42	2·71	165·1	5·5, 9·5
68 Herculis	June—Aug.	17 13·1	+33 14	4·41	61·8	5·1, 10·1
ψ Cassiop.	Aug.—Feb.	1 17·9	+67 32	28·7, 3·08	106·8, 256·0	4·5, 9·7, 10·6
Space-penetrating Tests						
14 Aurigæ	Nov.—Mar.	5 8·0	+32 33	11·9, 14·7	348·1, 225·4	5·1, 11·0, 7·5
14 Monoc.	Dec.—Apr.	6 28·6	+ 7 40	10·5	208·6	6·9, 10·9
40 Cassiop.	—	1 29·4	+72 27	53·3	237·0	6·0, 10·9
74 Oph.	June—Aug.	18 15·2	+ 3 19	27·9	285·6	5·0, 10·8
P. xxii. 36.	Aug.—Dec.	22 9·0	+39 9	27·2	178·5	6·0, 11·0
12 Ceti	Dec.—Feb.	0 24·2	− 4 35	8·6, 212·4	187·0, 110·3	6·2, 10·9, 10·0
20 Pegasi	Aug.—Nov.	21 55·5	+12 34	51·1	325·5	5·5, 11·4
55 Androm.	Aug.—Feb.	1 46·3	+40 10	60·1	355·2	5·5, 11·5
54 Sagittarii	July—Sept.	19 34·2	−16 32	35·8, 45·6	244·5, 41·7	5·5, 11·5, 9·0
96 Aquarii	Oct.—Dec.	23 13·5	− 5 45	9·9	23·5	6·2, 11·3
85 Virginis	Apr.—June	13 39·4	−15 12	43·3	311·8	6·0, 11·7
56 Aquilæ	Aug.—Oct.	19 47·9	− 8 52	46·7	77·8	5·7, 11·8

Six Inches Aperture.

Name of Object	Visible	R.A.	Decl.	Distances	Posit. Angles	Magnitude
		h. m.	° ′	″	°	
Dividing Tests						
Canis Maj. 89	Feb.—April	6 43·8	−15 1	0·97	288·9	6·0, 8·7
P. iv. 288	Oct.—Feb.	4 58·6	+19 38	0·88	336·8	6·5, 7·2
OΣ 175	Nov.—Mar.	5 27·9	+31 12	0·87	332·2	5·5, 6·5
Σ 2924	—	22 29·7	+69 20	0·84	265·6	6·5, 7·0
OΣ 229	Feb.—June	10 41·5	+41 42	0·84	330·1	6·5, 7·5
P. v. 222	Nov.—Mar.	5 41·5	+20 50	0·85, 75·6	314·7, 161·3	6·2, 8·0, 7·5
OΣ 383	July—Dec.	19 39·0	+40 27	0·85	25·1	6·5, 7·9
Σ 1883	April—July	14 43·2	+ 6 26	0·82	259·0	7·0, 7·0
OΣ 369	—	19 8·8	+71 54	0·80	41·3	7·0, 7·5
Σ 2215	June—Sept.	17 42·1	+17 44	0·79	300·3	6·1, 7·8
μ^2 Boötis	May—Sept.	15 20·3	+37 47	108·4, 0·78	171·5, 104·0	4·5, 6·5, 7·8
β 132	July—Sept.	18 4·5	−19 52	0·79	237·0	6·7, 7·2
Defining Tests						
Cygni 153	July—Dec.	20 9·3	+51 7	4·03	81·2	5·9, 10·9
θ Aurigæ	Nov.—Mar.	5 52·0	+37 12	2·37	358·5	3·0, 8·6
κ Leonis	Feb.—June	9 18·0	+26 41	3·36, 10	205·1, 65	5·1, 10·2, 11·5
π Cephei	—	23 4·3	+74 46	1·31	27·3	4·7, 8·7
6 Serpentis	May—July	15 15·2	+ 1 8	2·28	13·2	4·7, 9·4
Cancri 5	Dec.—April	7 54·2	+23 54	2·70	332·5	6·1, 10·7
Space-penetrating Tests						
ι Ceti	Dec.—Feb.	0 13·6	− 9 28	62·0	15·5	4·0, 11·5
1 Aquarii	July—Oct.	20 33·6	+ 0 6	55·9, 72·9	217·4, 38·9	5·5, 11·5, 11·3
115 Tauri	Dec.—April	5 20·5	+17 52	10·2	308·4	6·0, 11·4
Pegasi 129	Aug.—Nov.	22 4·8	+14 4	21·5	253·4	6·0, 11·8
72 Virginis	April—June	13 24·5	− 5 53	29·2	16·1	6·2, 11·8
δ Cancri	Jan.—April	8 38·2	+18 37	41·9	113·2	5·0, 11·8
41 Sextantis	April—June	10 44·6	− 8 18	27·0	303·8	6·0, 11·8
ρ Boötis	May—July	14 26·9	+30 52	53·3	334·0	3·6, 11·7
α^2 Capricorni	Aug.—Oct.	20 11·7	−12 54	7·7	147·9	3·5, 11·5
o Cassiop.	Aug.—Feb.	0 38·3	+47 40	32·2	303·9	5·0, 12·0
τ Aurigæ	Nov.—April	5 41·3	+39 8	38·9, 47·9	350·0, 32·9	5·0, 12·0, 11·0
110 Herculis	June—Sept.	18 40·8	+20 26	44·7, 61·2	95·6, 92·0	5·0, 12·0, 11·0

Seven Inches Aperture.

Name of Object	Visible	R. A.	Decl.	Distances	Posit. Angles	Magnitude
Dividing Tests		h. m.	° ′	″	°	
73 Ophiuchi	June—Aug.	18 3·9	+ 3 58	0·83	249·5	6·0, 7·6
54 Aurigæ	Jan.—Apr.	6 32·4	+28 22	0·83	36·9	6·0, 8·0
OΣ 338	June—Sept.	17 46·8	+15 21	0·72	25·0	6·2, 6·4
Hydræ 348	Apr.—June	12 57·6	−19 58	0·71	133·4	6·2, 6·2
Cygni 226	July—Dec.	20 35·4	+40 10	0·70, 69·0	23·7, 69·8	6·4, 6·6, 7·6
16 Vulpeculæ	July—Nov.	19 57·2	+24 37	0·69	94·5	5·7, 5·9
Dawes 6	Dec.—Mar.	5 23·3	− 3 24	0·69	84·4	7·1, 7·4
OΣ 156	Dec.—Apr.	6 40·7	+18 19	0·68	317·1	6·6, 6·6
η Coronæ	May—Aug.	15 18·5	+30 42	0·65	182·2	5·7, 6·0
λ Cygni	Aug.—Dec.	20 43·0	+36 4	0·65	80·3	5·0, 7·0
B.A.C. 8277	July—Mar.	23 43·2	+64 15	0·58, 48·9	253·8, 353·4	6·5, 7·7, 8·5
P. xviii. 132	June—Sept.	18 30·8	+23 31	0·56	352·1	6·3, 6·6
Defining Tests						
44 Cygni	July—Dec.	20 26·7	+36 33	2·26	157·9	6·3, 11·0
58 Ceti	Nov.—Feb.	1 52·2	− 2 37	2·73	12·8	6·3, 11·5
Lyræ 91	June—Nov.	18 50·7	+33 49	1·86, 45·3	133·9, 350·6	6·0, 10·0, 7·3
τ Cygni	Aug.— Dec.	21 10·2	+37 33	1·10	116·3	3·7, 7·8
46 Virginis	Apr.—June	12 54·7	− 2 45	1·44	151·5	5·4, 9·5
46 Eridani	Dec.—Mar.	4 28·4	− 6 59	1·47	57·0	6·0, 10·0
Space-penetrating Tests						
β Aquarii	Sept.—Nov.	21 25·6	− 6 4	34·3, 54·5	318·9, 184·9	3·0, 10·9, 11·5
τ Boötis	Apr.—June	13 41·8	+18 2	8·9	352·0	4·1, 11·5
94 Ceti	Dec.—Feb.	3 6·9	− 1 37	5·7	250·9	5·5, 11·5
κ Delphini	July—Nov.	20 33·6	+ 9 41	12·5	319·0	5·2, 11·8
α^2 Cancri	Jan.—Apr.	8 52·3	+12 18	11·1	325·0	4·4, 12·0
β Aquilæ	July—Oct.	19 49·7	+ 6 7	12·5	17·7	3·7, 12·1
B.A.C. 8173	—	23 21·4	+70 3	20·1	312·3	6·5, 11·9
χ Delphini	July—Nov.	20 50·2	+12 7	40·0	21·8	6·0, 12·0
ξ Pegasi	Aug.—Nov.	22 41·0	+11 35	11·9, 127·3	112·6, 21·8	4·6, 12·2, 11·3
30 Pegasi	Aug.—Nov.	22 14·7	+ 5 13	6·3, 10·1	20·7, 222·8	6·0, 11·4, 12·3
53 Virginis	Apr.—June	13 6·0	−15 35	70·9	9·6	6·0, 12·5
30 Geminorum	Dec.—Apr.	6 37·5	+13 21	28·0	184·1	6·0, 12·7

SELENOGRAPHICAL LONGITUDES AND LATITUDES OF LUNAR CRATERS.

Name of Crater	Longitude +=West −=East	Latitude N=North S=South	Name of Crater	Longitude +=West −=East	Latitude N=North S=South
	° ′	° ′		° ′	° ′
Agrippa (102) i.	+10 22	N 4 4	Hesiodus (B) [187] iii.	−17 0	S 26 50
Airy (291) iv.	+ 5 54	S 17 46	Hyginus (93) i.	+ 6 22	N 8 2
Albategnius (289) iv.	+ 3 58	S 11 21	Kepler (144) ii.	−37 40	N 7 51
Alpetragius (205) iii.	− 4 45	S 15 55	La Hire (123) ii.	−25 10	N 27 18
Alphonsus (207) iii.	− 3 14	S 12 59	Lalande (210) iii.	− 8 46	S 4 27
Archimedes (A) [120] ii.	− 7 11	N 27 45	Landsberg (222) iii.	−26 20	S 0 27
Archytas (46) i.	+ 4 13	N 58 24	Langrenus (338) iv.	+60 30	S 8 33
Argelander (467) iv.	+41 43	S 45 46	Laplace (A) [134] ii.	−26 34	N 43 16
Aristarchus (148) ii.	−47 10	N 23 32	Le Monnier (A) [53] i.	+29 8	N 26 0
Aristillus (83) i.	+ 1 1	N 33 45	Lichtenberg (151) ii.	−67 5	N 31 25
Beer (446) iv.	+34 33	S 17 48	Lindenau (370) iv.	+24 30	S 31 52
Bessarion (145) ii.	−37 4	N 14 52	Linné (74) i.	+11 33	N 27 48
Bessel (73) i.	+17 22	N 21 54	Mädler (466) iv.	+29 12	S 10 56
Billy (266) iii.	−49 58	S 14 0	Manilius (95) i.	+ 8 47	N 14 27
Bode (107) ii.	− 2 39	N 6 37	Marius (147) ii.	−50 6	N 11 50
Brayley (479) ii.	−36 52	N 20 54	Maskelyne (67) i.	+29 40	N 2 32
Bullialdus (213) iii.	−22 7	S 20 30	Menelaus (70) i.	+15 31	N 16 24
Burg (50) i.	+27 32	N 44 57	Messier (327) iv.	+47 12	S 1 57
Calippus (76) i.	+10 29	N 38 46	Milichius (118) ii.	−29 40	N 10 0
Campanus (226) iii.	−27 27	S 27 37	Moretus (262) iii.	− 7 9	S 69 45
Capella (324) iv.	+34 48	S 7 33	Mösting (211) iii.	− 5 54	S 0 36
Capuanus (238) iii.	−25 42	S 34 20	Murchison (A) [483] i.	+ 1 0	N 4 4
Carlini (128) ii.	−24 3	N 33 30	Mutus (400) iv.	+29 22	S 63 6
Cassini (A) [81] i.	+ 4 9	N 40 23	Neander (373) iv.	+39 45	S 31 10
Censorinus (325) iv.	+32 22	S 0 27	Olbers (159) ii.	−77 33	N 7 55
Cepheus (31) i.	+45 40	N 40 59	Petavius (340) iv.	+59 47	S 24 50
Cleomedes (12) i.	+54 47	N 26 50	Picard (4) i.	+53 52	N 14 28
Conon (88) i.	+ 1 57	N 21 31	Piccolomini (371) iv.	+31 45	S 29 11
Copernicus (112) ii.	−20 0	N 9 21	Pico (131) ii.	− 9 12	N 45 28
Crüger (278) iii.	−66 40	S 16 48	Plinius (61) i.	+23 23	N 15 17
Delambre (301) iv.	+17 29	S 2 1	Posidonius (A) [54] i.	+29 11	N 31 33
Delisle (127) ii.	−34 48	N 29 59	Proclus (60) i.	+46 30	N 16 10
Democritus (38) i.	+33 30	N 62 8	Prom. Agarum. (1) i.	+64 11	N 13 54
Dionysius (99) i.	+17 9	N 2 51	Pythagoras (176) ii.	−62 15	N 63 6
Dollond (303) iv.	+14 16	S 10 14	Pytheas (124) ii.	−20 30	N 20 14
Drebbel (240) iii.	−48 13	S 40 47	Ramsden (228) iii.	−31 42	S 32 26
Eichstädt (280) iii.	−70 27	S 20 31	Reiner (146) ii.	−56 1	N 7 5
Eimmart (3) i.	+62 50	N 23 35	Reinhold (114) ii.	−22 37	N 3 13
Encke (143) ii.	−36 37	N 4 18	Sacrobosco (312) iv.	+16 2	S 24 19
Eratosthenes (110) ii.	−11 37	N 14 24	Scheiner (A) [261] iii.	−26 36	S 59 58
Euclides (221) iii.	−29 25	S 7 11	Schubert (A) [10] i.	+77 16	N 2 28
Euler (125) ii.	−28 54	N 23 6	Seleucus (162) ii.	−65 48	N 20 54
Fabricius (383) iv.	+40 46	S 42 8	Taruntius (326) i.	+45 59	N 5 40
Franklin (32) i.	+47 12	N 38 39	Thales (36) i.	+49 12	N 61 58
Flamsteed (223) iii.	−44 12	S 4 31	Theophilus (319) iv.	+26 18	S 11 21
Gassendi (232) iii.	−39 31	S 16 57	Timocharis (121) ii.	−13 0	N 26 43
Goclenius (328) iv.	+44 29	S 10 0	Tobias Mayer (117) ii.	−28 50	N 15 33
Grimaldi (272) iii.	−68 58	S 2 43	Tycho (180) iii.	−11 52	S 42 52
Hansen (A) [11] i.	+74 0	N 13 17	Ukert (109) i.	+ 1 9	N 7 48
Harding (152) ii.	−70 52	N 43 9	Vitello (229) iii.	−37 12	S 30 0
Helicon (129) ii.	−22 53	N 40 10	Vitruvius (57) i.	+31 3	N 17 36
Hell (184) iii.	− 8 20	S 31 59	Werner (295) iv.	+ 3 6	S 27 30
Heraclides (135) ii.	−31 1	N 41 8	Wichmann (438) iii.	−37 56	S 7 41
Hercules (29) i.	+38 2	N 46 4	Wollaston (150) ii.	−46 54	N 30 17
Herschel (212) iii.	− 2 9	S 5 37	Zagut (365) iv.	+21 56	S 31 42

1″ of arc at the mean distance of the Moon is equal to 1·14 miles.
1° of selenographical longitude or latitude at the centre of the Moon is equal to 16″·6 of arc, or 18·9 miles.

LUNAR CRATERS IN ORDER OF SELENOGRAPHICAL LONGITUDE.

Longitude + = West	Name of Crater	Latitude N = North S = South
+77° 16′	Schubert (A) [10] i.	N 2° 28′
74 0	Hansen (A) [11] i.	N 13 17
64 11	Prom. Agarum. (1) i.	N 13 54
62 50	Eimmart (3) i.	N 23 35
60 30	Langrenus (338) iv.	S 8 33
59 47	Petavius (340) iv.	S 24 50
54 47	Cleomedes (12) i.	N 26 50
53 52	Picard (4) i.	N 14 28
49 12	Thales (36) i.	N 61. 58
47 12	Franklin (32) i.	N 38 39
47 12	Messier (327) iv.	S 1 57
46 30	Proclus (60) i.	N 16 10
45 59	Taruntius (326) i.	N 5 40
45 40	Cepheus (31) i.	N 40 59
44 29	Goclenius (328) iv.	S 10 0
41 43	Argelander (467) iv.	S 45 46
40 46	Fabricius (383) iv.	S 42 8
39 45	Neander (373) iv.	S 31 10
38 2	Hercules (29) i.	N 46 4
34 48	Capella (324) iv.	S 7 33
34 33	Beer (446) iv.	S 17 48
33 30	Democritus (38) i.	N 62 8
32 22	Censorinus (325) iv.	S 0 27
31 45	Piccolomini (371) iv.	S 29 11
31 3	Vitruvius (57) i.	N 17 36
29 40	Maskelyne (67) i.	N 2 32
29 22	Mutus (400) iv.	S 63 6
29 12	Mädler (466) iv.	S 10 56
29 11	Posidonius (A) [54] i.	N 31 33
29 8	Le Monnier (A) [53] i.	N 26 0
27 32	Burg (50) i.	N 44 57
26 18	Theophilus (319) iv.	S 11 21
24 30	Lindenau (370) iv.	S 31 52
23 23	Plinius (61) i.	N 15 17
21 56	Zagut (369) iv.	S 31 42
17 29	Delambre (301) iv.	S 2 1
17 22	Bessel (73) i.	N 21 54
17 9	Dionysius (99) i.	N 2 51
16 2	Sacrobosco (312) iv.	S 24 19
15 31	Menelaus (70) i.	N 16 24
14 16	Dollond (303) iv.	S 10 14
11 33	Linné (74) i.	N 27 48
10 29	Calippus (76) i.	N 38 46
10 22	Agrippa (102) i.	N 4 4
8 47	Manilius (95) i.	N 14 27
6 22	Hyginus (93) i.	N 8 2
5 54	Airy (291) iv.	S 17 46
4 13	Archytas (46) i.	N 58 24
4 9	Cassini (A) [81] i.	N 40 33
3 58	Albategnius (289) iv.	S 11 21
3 6	Werner (295) iv.	S 27 30
1 57	Conon (88) i.	N 21 31
1 9	Ukert (109) i.	N 7 48
1 1	Aristillus (83) i.	N 33 45
+ 1 0	Murchison (A) [483] i.	N 4 4

Longitude − = East	Name of Crater	Latitude N = North S = South
− 2° 9′	Herschel (212) iii.	S 5° 37′
2 39	Bode (107) ii.	N 6 37
3 14	Alphonsus (207) iii.	S 12 59
4 45	Alpetragius (205) iii.	S 15 55
5 54	Mösting (211) iii.	S 0 36
7 9	Moretus (262) iii.	S 69 45
7 11	Archimedes (A) [120] ii.	N 27 45
8 20	Hell (184) iii.	S 31 59
8 46	Lalande (210) iii.	S 4 27
9 12	Pico (131) ii.	N 45 28
11 37	Eratosthenes (110) ii.	N 14 24
11 52	Tycho (180) iii.	S 42 52
13 0	Timocharis (121) ii.	N 26 43
17 0	Hesiodus (B) [187] iii.	S 26 50
20 0	Copernicus (112) ii.	N 9 21
20 30	Pytheas (124) ii.	N 20 14
22 7	Bullialdus (213) iii.	S 20 30
22 37	Reinhold (114) ii.	N 3 13
22 53	Helicon (129) ii.	N 40 10
24 3	Carlini (128) ii.	N 33 30
25 10	La Hire (123) ii.	N 27 18
25 42	Capuanus (238) iii.	S 34 20
26 20	Landsberg (222) iii.	S 0 27
26 34	Laplace (A) [134] ii.	N 43 16
26 36	Scheiner (A) [261] iii.	S 59 58
27 27	Campanus (226) iii.	S 27 37
28 50	Tobias Mayer (117) ii.	N 15 33
28 54	Euler (125) ii.	N 23 6
29 25	Euclides (221) iii.	S 7 11
29 40	Milichius (118) ii.	N 10 0
31 1	Heraclides (135) ii.	N 41 8
31 42	Ramsden (228) iii.	S 32 26
34 48	Delisle (127) ii.	N 29 59
36 37	Encke (143) ii.	N 4 18
36 52	Brayley (479) ii.	N 20 54
37 4	Bessarion (145) ii.	N 14 52
37 12	Vitello (229) iii.	S 30 0
37 40	Kepler (144) ii.	N 7 51
37 56	Wichmann (438) iii.	S 7 41
39 31	Gassendi (232) iii.	S 16 57
44 12	Flamsteed (223) iii.	S 4 31
46 54	Wollaston (150) ii.	N 30 17
47 10	Aristarchus (148) ii.	N 23 32
48 13	Drebbel (240) iii.	S 40 47
49 58	Billy (266) iii.	S 14 0
50 6	Marius (147) ii.	N 11 50
56 1	Reiner (146) ii.	N 7 5
62 15	Pythagoras (176) ii.	N 63 6
65 48	Seleucus (162) ii.	N 20 54
66 40	Crüger (278) iii.	S 16 48
67 5	Lichtenberg (151) ii.	N 31 25
68 58	Grimaldi (272) iii.	S 2 43
70 27	Eichstädt (280) iii.	S 20 31
70 52	Harding (152) ii.	N 43 9
−77 33	Olbers (159) ii.	N 7 55

SEPARATING POWER OF TELESCOPES.

Dawes (*Memoirs of the Royal Astronomical Society*, volume xxxv. p. 158) found by a great variety of experiments with small telescopes that a one-inch aperture would just separate a double star composed of two stars of the sixth magnitude if their central distance was 4″·56, when the atmospheric circumstances were moderately favourable. The following little table, as calculated by him, will be convenient for reference.

Aperture in Inches	Least separable Distance	Aperture in Inches	Least separable Distance	Aperture in Inches	Least separable Distance
	″		″		″
1·0	4·56	4·0	1·14	7·0	0·65
1·5	3·04	4·5	1·01	8·0	0·57
2·0	2·28	5·0	0·91	9·0	0·507
2·5	1·82	5·5	0·83	10·0	0·456
3·0	1·52	6·0	0·76	11·0	0·414
3·5	1·30	6·5	0·70	12·0	0.380

SPACE-PENETRATING POWER OF TELESCOPES.

The following table, based on the assumption that a star of any magnitude contains $2\frac{1}{2}$ times the light of one of the magnitude next below, is taken from Newcomb and Holden's *Astronomy*, 4th edition, page 419. This is practically Struve's ratio.

Aperture in Inches	Faintest Star Visible	Aperture in Inches	Faintest Star Visible	Aperture in Inches	Faintest Star Visible
	Mag.		Mag.		Mag.
1·0	9·0	4·0	12·0	7·0	13·3
1·5	9·9	4·5	12·3	8·0	13·5
2·0	10·5	5·0	12·5	9·0	13·8
2·5	11·0	5·5	12·7	10·0	14·0
3·0	11·4	6·0	12·9	11·0	14·2
3·5	11·7	6·5	13·1	12·0	14·4

APPENDIX.

Heliocentric Minima of β Persei (*Algol*) $3^h\ 0^m\ 45^s + 40°\ 31'\cdot 0$.

	Days	hrs.	min.		Days	hrs.	min.		Days	hrs.	min.		Days	hrs.	min.
1886, Jan.	13	14	23	March	6	5	3	August	16	15	30	October	24	11	4
	16	11	12		20	13	7		19	12	19		27	7	53
	19	8	1		23	9	56		22	9	8	November	13	12	46
	22	4	50	April	9	14	50	September	8	14	1		16	9	35
February	5	12	55		12	11	39		11	10	50		19	6	24
	8	9	43		15	8	27		14	7	39	December	3	14	28
	11	6	32	July	7	12	6	October	1	12	32		6	11	17
	25	14	36		10	8	55		4	9	21		9	8	6
	28	11	25		27	13	29		7	6	10		26	12	59
March	3	8	14		30	10	37		21	14	15		29	9	48

Algol, 2·2 mag. at maximum, 3·7 at minimum. It commences to diminish in light 4 hours 23 minutes before minimum, and regains its full brilliancy 5 hours and 37 minutes after. The most rapid decrease of light begins at 1 hour 40 minutes before the minimum, and the most rapid increase 1 hour 40 minutes after.

Heliocentric Minima of δ Libræ $14^h\ 54^m\ 53^s - 8°\ 3'\cdot 9$. 4·9 mag. max. 6·1 mag. min.

	Days	hrs.	min.		Days	hrs.	min.		Days	hrs.	min.		Days	hrs.	min.
April	3	16	44	May	1	15	0	June	5	12	50	July	3	11	6
	10	16	18		8	14	34		12	12	24		10	10	40
	17	15	52		15	14	8		19	11	58		17	10	14
	24	15	26		22	13	42		26	11	32		24	9	48
					29	13	16						31	9	22

VARIABLE STARS.

Name of Variable Star	R.A.	Decl.	Magnitude		Ephemeris (1886)		Notes and Colours
			Maximum	Minimum	Maximum	Minimum	
	h. m. s.	° ′					
R. Andromedæ .	0 18 1	+37 56·7	5·6–8·6	Below 13	February 10	September 1	The minimum is derived from Schmidt's observations in 1883. Schönfeld gives maximum December 23, 1885.
R. Arietis . .	2 9 38	+24 31·5	7·6–8·6	12·3	February 6, August 11	November 10 (1885), May 15, Nov. 17	Close to the 6th mag. star 21 Arietis.
o Ceti (*Mira*) .	2 13 35	− 3 29·7	1·7–5	8–9·5	January 5	August 15	Very red near minimum, a blue 9·5 mag. at 83° : 116″.
R. Leporis . .	4 54 25	−14 58·7	6·7	8·5	December 12	April 26	Hind's scarlet star. Irregular. In 1883 the maxima and minima took place 8 weeks before the predicted times.
S. Orionis . .	5 23 23	− 4 47·0	8·5	Below 13	November 1	April 15	Very red. Period rather uncertain.
R. Leonis . .	9 41 26	+11 57·4	5·2–6·4	9·4–10	November 9 (1885), September 18	April 23	Very red.
R. Ursæ Maj. .	10 36 34	+69 22·4	6·1–8·1	13·4	May 11	January 28	Orange.
R. Virginis . .	12 32 43	+ 7 37·0	6·5–7·5	10–10·9	November 15 (1885), April 9, September 2	January 31, June 25, November 18	Reddish at maximum, deeper at minimum, like many other variables.
R. Hydræ . .	13 23 30	−22 41·5	4 –5·5	10·5	November 2	April 16	Red. P. xiii. 94.
R. Aquilæ . .	19 0 53	+ 8 3·5	6·4–7·4	11·2	May 11	November 21	Reddish.
χ^a Cygni . .	19 46 11	+32 37·6	4·0–6·0	12·8	January 8	July 19	χ of Bayer, not χ of Flamsteed. Fine red.
T. Cephei . .	21 8 2	+68 1·6	6·4	9·8	March 13	September 20	Reddish.

POSITION OF THE LUNAR TERMINATOR (MIDNIGHT).

\+ = W. Longitude; M = Morning Terminator, or Sun-rising.
− = E. Longitude; E = Evening Terminator, or Sun-setting.

1885.

Days	°	′		Days	°	′		Days	°	′		Days	°	′	
November 1	−25	46	E	November 17	−40	30	M	December 2	−42	57	E	December 17	−45	21	M
2	−37	55	E	18	−52	39	M	3	−55	7	E	18	−57	30	M
3	−50	6	E	19	−64	49	M	4	−67	16	E	19	−69	39	M
4	−62	16	E	20	−76	59	M	5	−79	26	E	20	−81	48	M
5	−74	27	E	21	Full Moon			6	New Moon			21	Full Moon		
6	New Moon			22	+78	42	E	7	+76	15	M	22	+73	52	E
7	+81	13	M	23	+66	31	E	8	+64	5	M	23	+61	43	E
8	+69	2	M	24	+54	22	E	9	+51	56	M	24	+49	33	E
9	+56	52	M	25	+42	12	E	10	+39	46	M	25	+37	24	E
10	+44	41	M	26	+30	1	E	11	+27	37	M	26	+25	14	E
11	+32	32	M	27	+17	52	E	12	+15	27	M	27	+13	5	E
12	+20	21	M	28	+ 5	42	E	13	+ 3	17	M	28	+ 0	56	E
13	+ 8	12	M	29	− 6	27	E	14	− 8	52	M	29	−11	13	E
14	− 3	59	M	30	−18	37	E	15	−21	2	M	30	−23	23	E
15	−16	10	M	December 1	−30	47	E	16	−33	11	M	31	−35	33	E
16	−28	19	M												

1886.

January 1	−47	42	E	February 4	+78	54	M	March 10	+25	4	M	April 13	−29	19	M
2	−59	52	E	5	+66	43	M	11	+12	54	M	14	−41	30	M
3	−72	2	E	6	+54	33	M	12	+ 0	42	M	15	−53	42	M
4	−84	11	E	7	+42	23	M	13	−11	28	M	16	−65	54	M
5	New Moon			8	+30	14	M	14	−23	39	M	17	−78	4	M
6	+71	31	M	9	+18	4	M	15	−35	49	M	18	Full Moon		
7	+59	21	M	10	+ 5	54	M	16	−48	1	M	19	+77	30	E
8	+47	11	M	11	− 6	15	M	17	−60	12	M	20	+65	17	E
9	+35	2	M	12	−18	26	M	18	−72	22	M	21	+53	7	E
10	+22	52	M	13	−30	35	M	19	Full Moon			22	+40	53	E
11	+10	44	M	14	−42	46	M	20	+83	16	E	23	+28	41	E
12	− 1	26	M	15	−54	56	M	21	+71	5	E	24	+16	29	E
13	−13	35	M	16	−67	6	M	22	+58	54	E	25	+ 4	17	E
14	−25	45	M	17	−79	15	M	23	+46	42	E	26	− 7	56	E
15	−37	55	M	18	Full Moon			24	+34	32	E	27	−20	8	E
16	−50	5	M	19	+76	24	E	25	+22	20	E	28	−32	21	E
17	−62	14	M	20	+64	14	E	26	+10	10	E	29	−44	32	E
18	−74	23	M	21	+52	3	E	27	− 2	2	E	30	−56	45	E
19	Full Moon			22	+39	53	E	28	−14	13	E	May 1	−68	57	E
20	+81	18	E	23	+27	42	E	29	−26	24	E	2	−81	10	E
21	+69	8	E	24	+15	32	E	30	−38	36	E	3	New Moon		
22	+56	59	E	25	+ 3	22	E	31	−50	48	E	4	+74	26	M
23	+44	49	E	26	− 8	49	E	April 1	−62	59	E	5	+62	13	M
24	+32	39	E	27	−20	59	E	2	−75	9	E	6	+50	1	M
25	+20	29	E	28	−33	10	E	3	−87	20	E	7	+37	48	M
26	+ 8	9	E	March 1	−45	20	E	4	New Moon			8	+25	36	M
27	− 3	49	E	2	−57	31	E	5	+68	15	M	9	+13	24	M
28	−15	59	E	3	−69	41	E	6	+56	3	M	10	+ 1	10	M
29	−28	8	E	4	−81	52	E	7	+43	52	M	11	−11	2	M
30	−40	18	E	5	New Moon			8	+31	40	M	12	−23	14	M
31	−52	28	E	6	+73	47	M	9	+19	29	M	13	−35	28	M
February 1	−64	37	E	7	+61	36	M	10	+ 7	17	M	14	−47	41	M
2	−76	47	E	8	+49	26	M	11	− 4	54	M	15	−59	53	M
3	New Moon			9	+37	15	M	12	−17	6	M	16	−72	6	M

Days	°	′	
May 17 Full Moon			
18	83	28	E
19	71	15	E
20	59	3	E
21	46	49	E
22	34	37	E
23	22	24	E
24	10	11	E
25	2	2	E
26	14	16	E
27	26	28	E
28	38	41	E
29	50	54	E
30	63	7	E
31	75	21	E
June 1	87	33	E
2 New Moon			
3	68	0	M
4	55	47	M
5	43	34	M
6	31	21	M
7	19	7	M
8	6	55	M
9	5	19	M
10	17	33	M
11	29	46	M
12	41	59	M
13	54	13	M
14	66	26	M
15	78	39	M
16 Full Moon			
17	76	54	E
18	64	40	E
19	52	27	E
20	40	15	E
21	28	1	E
22	15	46	E
23	2	35	E
24	8	39	E
25	20	53	E
26	33	6	E
27	45	20	E
28	57	33	E
29	69	45	E
30	81	59	E
July 1 New Moon			
2	73	35	M
3	61	22	M
4	49	7	M
5	36	54	M
6	24	42	M
7	12	29	M
8	0	14	M
9	12	0	M
10	24	13	M
11	36	27	M
12	48	39	M
13	60	53	M

Days	°	′	
July 14	73	6	M
15 Full Moon			
16	82	27	E
17	70	14	E
18	58	0	E
19	45	48	E
20	33	36	E
21	21	23	E
22	9	8	E
23	3	6	E
24	15	19	E
25	27	32	E
26	39	45	E
27	51	59	E
28	64	12	E
29	76	25	E
30 New Moon			
31	79	9	M
August 1	66	55	M
2	54	42	M
3	42	29	M
4	30	16	M
5	18	3	M
6	5	50	M
7	6	23	M
8	18	36	M
9	30	49	M
10	43	3	M
11	55	15	M
12	67	27	M
13	79	40	M
14 Full Moon			
15	75	54	E
16	63	41	E
17	51	28	E
18	39	16	E
19	27	1	E
20	14	49	E
21	2	36	E
22	9	36	E
23	21	49	E
24	34	1	E
25	46	14	E
26	58	27	E
27	70	39	E
28	82	52	E
29 New Moon			
30	72	43	M
31	60	30	M
September 1	48	17	M
2	36	5	M
3	23	52	M
4	11	40	M
5	0	32	M
6	12	45	M
7	24	57	M
8	37	10	M

Days	°	′	
September 9	49	21	M
10	61	34	M
11	73	46	M
12	85	58	M
13 Full Moon			
14	69	38	E
15	57	25	E
16	45	14	E
17	33	1	E
18	20	50	E
19	8	38	E
20	3	34	E
21	15	46	E
22	27	58	E
23	40	9	E
24	52	22	E
25	64	33	E
26	76	45	E
27 New Moon			
28	78	52	M
29	66	41	M
30	54	29	M
October 1	42	17	M
2	30	6	M
3	17	54	M
4	5	41	M
5	6	29	M
6	18	40	M
7	30	52	M
8	43	5	M
9	55	14	M
10	67	25	M
11	79	36	M
12 Full Moon			
13	76	12	E
14	64	0	E
15	51	48	E
16	39	28	E
17	27	17	E
18	15	6	E
19	2	55	E
20	9	16	E
21	21	27	E
22	33	37	E
23	45	47	E
24	57	58	E
25	70	10	E
26	82	21	E
27 New Moon			
28	73	18	M
29	61	8	M
30	48	57	M
31	36	46	M
November 1	24	36	M
2	12	25	M
3	0	14	M
4	11	54	M

Days	°	′	
November 5	24	5	M
6	36	15	M
7	48	25	M
8	60	36	M
9	72	46	M
10	84	57	M
11 Full Moon			
12	70	44	E
13	58	35	E
14	46	24	E
15	34	13	E
16	22	4	E
17	9	52	E
18	2	17	E
19	14	27	E
20	26	37	E
21	38	47	E
22	50	56	E
23	63	7	E
24	75	16	E
25 New Moon			
26	80	23	M
27	68	14	M
28	56	4	M
29	43	55	M
30	31	45	M
December 1	19	35	M
2	7	25	M
3	4	45	M
4	16	55	M
5	29	4	M
6	41	14	M
7	53	24	M
8	65	34	M
9	77	42	M
10 Full Moon			
11	77	59	E
12	65	49	E
13	53	39	E
14	41	30	E
15	29	20	E
16	17	11	E
17	5	1	E
18	7	8	E
19	19	17	E
20	31	26	E
21	43	36	E
22	55	46	E
23	67	55	E
24	80	5	E
25 New Moon			
26	75	36	M
27	63	27	M
28	51	18	M
29	39	9	M
30	26	59	M
31	14	49	M

THE COMETS OF 1886.

Three periodical comets are expected to return to perihelion in the year 1886. These are (1) a comet having a period of about $5\frac{1}{2}$ years, which was discovered by Tempel at Florence in November 1869. The return in 1875 was not observed, but it was re-discovered by Prof. L. Swift, of Rochester, New York, in October 1880, when the fact of its periodicity was determined. Perihelion passage will take place about April 21, 1886, but its position in the heavens will be very unfavourable for observation, and it is not likely to be seen again until its next return in October 1891.

(2) A comet, first discovered by Pons at Marseilles in June 1819, which is also moving in an ellipse with a period of about $5\frac{1}{2}$ years. It was re-discovered by Dr. Winnecke in 1858, and its periodicity was then determined by him. It was well observed in 1869 and 1875, but not in 1864 and 1880, when the circumstances were unfavourable. It is usually known as Winnecke's comet. Perihelion passage will take place about August 30, 1886.

(3) A comet of long period, discovered by Olbers in March 1815, is expected to return again to perihelion towards the end of 1886. It will probably be bright enough to be generally observed. A sweeping ephemeris from January to October 1886 has been published by Dr. Ginzel in No. 2,696 of the *Astronomische Nachrichten*.

Three comets, discovered in 1885, are visible at the present time. They are :—

(1) A comet discovered by Mr. Brooks, of Phelps, New York, at the end of December 1885. This comet passed its perihelion on November 24, 1885, and is slowly receding from the earth, and growing fainter.

(2) A comet discovered by M. Fabry at the Paris Observatory on December 1, 1885. This comet is only observable with large telescopes. Perihelion passage, according to the elements calculated by Dr. Oppenheim, will take place on April 4, 1886. The brightness is slowly increasing at present.

(3) A comet discovered by Mr. Barnard, at the Vanderbilt University Observatory, Nashville, Tennessee, on December 3, 1885. This comet is also very faint Perihelion passage will take place about May 5, 1886. The elements bear some resemblance to those of the second comet of 1785. Its brightness is slowly increasing at present.

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ADDENDA.

The orbit of comet Fabry has been recently calculated by several astronomers, including Dr. S. Oppenheim and M. Lebeuf, and it appears from their investigations that this comet, instead of decreasing in brightness, promises to be a very conspicuous object in the circumpolar sky towards the end of April and the beginning of May. According to Dr. Oppenheim its brightness on May 1 will be over six hundred times greater than that at the time of discovery.

The orbit of comet Barnard has also been investigated by Dr. Heppenger, with a somewhat similar result. About the middle of May this comet will be nearly three hundred times brighter than at the date of discovery.

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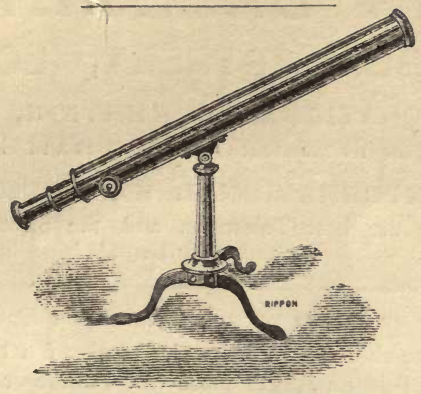

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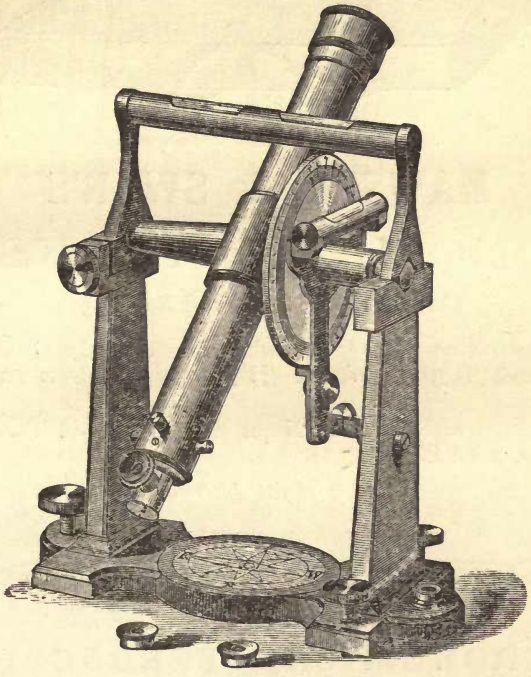

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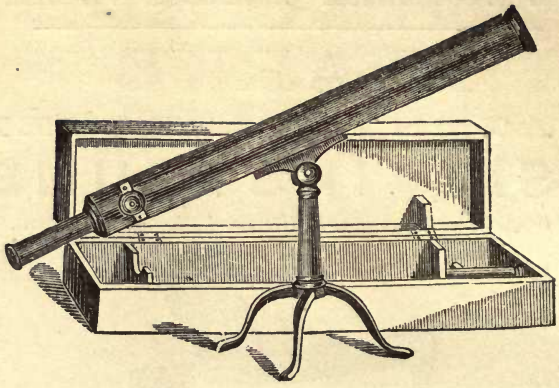

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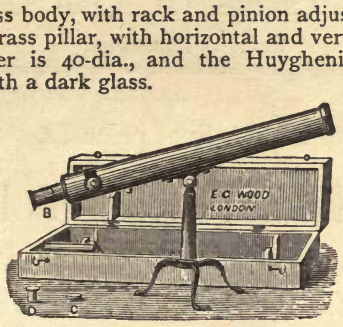
Price 

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